POWERING SABAH'S SUSTAINABLE PROSPERITY

Pre-Feasibility Report

Produced on the Malaysian Young Leaders Programme
April 2019

GIFT
GLOBAL INSTITUTE FOR TOMORROW.

Table of Contents

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Glossary

CBO	-	Community Based organisations
COE	-	Center of Excellence
CREATE	-	Centre for Renewable Energy and Appropriate Technology
EPC	-	Engineering, Procurement and Construction
FIT	-	Feed In Tariff
GLC	-	Government Linked Company
ILP	-	Industrial Training Institute (Institut Latihan Perindustrian)
IPP	-	Independent Power Producers
JOAS	-	The Indigenous Peoples' Network of Malaysia (Jaringan Orang Asli Asal Semalaysia)
JKR	-	Public Work Department (Jabatan Kerja Raya)
KPLB	-	Rural Development Ministry (Kementerian Pembangunan Luar Bandar)
PBT	-	Local Authority (Pihak Berkuasa Tempatan)
PRE	-	Penampang Renewable Energy Sdn. Bhd.
PES	-	Payment for Ecosystem Services
PEU	-	Productive End Use/User
RESS	-	Rebate For Eco-System Services
SEC	-	Sabah Energy Commission
SREC	-	Sabah Renewal Energy Commission
REMP	-	Rural Electrification Master Plan
SESB	-	Sabah Electricity Sdn. Bhd.
SEDA	-	Sustainable Energy Development Authority
UMS	-	University Malaysia Sabah

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Executive Summary (1)

Overview of Sabah

Sabah is Malaysia's second largest state, located on the Northern tip of Borneo Island, with a population of 3.9 million spread across 42 ethnic groups. The economy is divided between primary and tertiary sectors: mining and quarrying (29.6%) and agriculture (19.1%) for the former, and tourism (11%) for the latter. Because of its abundance in natural resources, its main exports are oil, gas, palm oil and timber. Over half of Sabah's landmass is a dedicated reserve, helping to preserve Malaysia's status as one of 17 mega-diversity countries in the world.

Overview of Challenges

With up to 40% of Sabah's population living in rural communities, there remain thousands of small indigenous villages too remote to be reached by the national power grid. Villagers have to rely on wood fire, diesel generators and kerosene lamps for basic energy needs, limiting their ability to address underdevelopment and poverty.

Today, energy access is recognised as a basic human need, enabling education, communication, poverty reduction and overall socioeconomic development. However, there are 603 villages with 19,671 houses in Sabah that are still not supplied with electricity according to a 2018 Sabah Electricity Board (SESB) assessment.

The key challenges in electrifying Sabah are the obstructive topography, isolating distances between settlements and poor road access. Collectively, these are symptomatic of a broader development challenge that encompasses the lack of basic needs provision in rural Sabahan communities.

Current Solutions

The Sabah government and SESB have made efforts to address the underdevelopment of rural communities through initiatives that aim to expand the grid into rural regions. The *Bekalan Elektrik Luar Bandar* (BELB) is one such scheme, which aims to increase the connection points of the utility grid by developing transmission lines while also funding on-site electricity sources such as diesel generators, diesel-battery hybrids and solar-diesel-battery hybrids. This has seen some success: between 2010 and 2017, a total of 29,260 households from 699 villages in the state benefited from access to electricity.

Additionally, Sabah has a vibrant non-profit ecosystem that has made significant progress on electrification and rural development. For example, non-profit entity **Tonibung** has been working with **Penampang Renewable Energy Sdn. Bhd. (PRE)** to provide rural communities with access to clean water and electricity through renewable energy focusing predominantly on micro-hydroelectric systems and sustainable solutions.

Tonibung and PRE have installed over 50 micro-hydro systems since 2005, providing electricity to 50,000 people. However, progress towards achieving their mandate of exhaustive rural electrification in Sabah is slow as they rely on funding that is both is infrequent and insufficient.

Executive Summary (2)

A Sustainable Solution

A business model has been proposed by the participants of GIFT's Malaysia Young Leaders Programme with the objective of implementing a development plan based on a public-private partnership model and the principles of sustainability. It will seek to improve the socioeconomic status of rural communities through the provision of basic needs with an emphasis on electrification through renewable energy microgrids, and accessibility through installing roads and communications.

Electricity alone cannot spur socioeconomic development and a more holistic approach is needed to supply villages with critical developmental requirements, including access to roads, healthcare, communications and upskilling. Under the circumstances, increased access to electricity will not only improve quality of life for rural community members, but can also lay the foundation for investments in other infrastructure and spur local economic activity. The development proposal comprises of the following key elements:

1. The establishment of a new Government Linked Company (GLC) called **SinaRaff** that will have a mandate to take a holistic approach to rural development in Sabah. This mandate includes the provision of renewable, affordable energy, accessibility and communications in the short-term; and education and healthcare in the long-term. Meeting these goals will be aligned with the Masterplan for Rural Electrification and Development for Sabah. Within the first 5 years of its operations, **SinaRaff** will provide renewable energy and road access to **200 villages**, impacting over **6,500 households** as well as creating over **1,500 jobs.**
2. **SinaRaff** will act as an interface between funding, policy and implementation, with an efficient and transparent governance structure: in essence, a professional management organisation that unlocks key government resources and policy advances.
3. The creation of a funding mechanism will be through a rural development foundation called **Yayasan Bayu**. It will run an Endowment Fund that relies on an initial government grant, and will be sustained by a proposed Rebate for Eco System Services (RESS) levy and private sector grants. The RESS is a Payment for Ecosystem Services (PES) mechanism sourced from a levy on a range of extractive industries operating in resource-rich rural areas.
4. The formation of an ecosystem of local SMEs to implement the development goals of **SinaRaff**. These SMEs will be involved in the manufacturing and installation of renewable energy systems and mini-grids; the construction and maintenance of roads and telecoms infrastructure; and the provision of education and healthcare. This SME ecosystem will have the added benefit of job creation for local residents.
5. Setting up a Centre of Excellence (CoE) that builds capacity within communities through knowledge transfer between **SinaRaff**, SMEs, civil society partners and villagers. The ultimate aim of the CoE is to create world-class appropriate technologies and equip local communities with the skills required to own, maintain and operate the newly installed infrastructure.

Financial Highlights

The proposal requires an initial seed funding of MYR 250 million (USD 60 million) from the government, of which around 8% will be used for the capital expense and initial operations of SinaRaff. The remaining balance of 92% will be placed in the Endowment Fund that will be managed by a Board of Trustees and the Investment Committee of **Yayasan Bayu**. The RESS levy will provide consistent additions to the Endowment Fund throughout operating years. From year 7 onwards, **SinaRaff's** operating cost would be fully covered by the return on investment from the Endowment Fund, thus achieving financial sustainability.

Introduction & Background

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Malaysia Young Leaders Programme

The Global Institute For Tomorrow (GIFT) is an independent pan-Asian think tank that provides content-rich and intellectually challenging executive education from an Asian worldview. GIFT's methodology invites participants to build greater self-awareness and test personal resilience whilst creating robust new business models linked to contemporary challenges and opportunities.

GIFT's **Malaysia Young Leaders Programme (MYLP)** brings together top public, private and civil sector professionals from across Malaysia to develop their leadership skills whilst engaging in constructive dialogue and cross-sectoral collaboration. This year the project team's focus area is electrification and economic development for Sabah's rural communities.

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Project Team

Young professionals from 12 organisations - including multinational companies, government and civil society groups - participated in the Malaysia YLP. The programme was carried out in two modules:

Module One: Classroom Module in Kuala Lumpur (25-30 Mar 2019)
Module Two: Experiential Learning in Kota Kinabalu (12-19 Apr 2019)

The project team worked together to produce a novel business model to address rural underdevelopment in Sabah. The model centres around the creation of a commercially viable Government Linked Company (GLC) that aims to elevate levels of rural development by supplying electricity, improving accessibility and communications, and through the creation of a Centre of Excellence to upskill rural community members.

A community-based model of operation and ownership will be leveraged for maximum rural uptake and the long-term sustainability of the model.

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Project Partners

Tonibung

TObpinai **NI**ngkokoton ko**BU**ruon Kampu**NG** (Friends of Village Development) is an indigenous-led non-profit NGO that develops sustainable alternatives for rural electrification while advocating for native rights and supporting local entrepreneurship and innovation around Southeast Asia. Its headquarters is based in the village of Nampasan, Penampang, Sabah.

The organisation installs micro-hydroelectric systems to power rural villages with the aid of other renewable energy sources, including photovoltaic and biogas systems. In all its projects, Tonibung utilises a **community-based approach** to ensure rural communities reach a position of independent management for all operational and financial aspects of the installed system. Importantly, villagers develop a sense of ownership over their system through careful research of village customs, establishment of communal funds, democratically elected committees, and the practice of gotong royong (shared labour).

Penampang Renewable Energy

Penampang Renewable Energy, Sdn. Bhd. (PRE) is a private organisation set up in 2009 as Tonibung's sister company. PRE's mission is to increase and improve energy access throughout Malaysia by providing Malaysian communities with affordable and integrated renewable energy services through an Appropriate Technology approach. This means it deeply understands the needs of local communities and constantly works to utilise and design technology that is suitable for a given rural context.

PRE provides and range of goods and services, such as:

- Manufacturing and retailing specialised Pelton turbines for local use.
- Designing and installing micro-hydro power and solar photovoltaic systems for commercial clients.

Between Tonibung and PRE, over 50 community based renewable energy systems have been set up across Sabah and Sarawak, ranging from 3kW – 40kW systems. Nine of these systems were commissioned more than five years ago and are still operating with little to no additional support from Tonibung. This has helped more than 50,000 people gain access to electricity.

Project Partners - Bios

Tonibung

Adrian Lasimbang, now a member of the Malaysian Senate, is the former executive director of Tonibung and helps run Penampang Renewable Energy. He is a technical advisor for Indigenous Peoples Network of Malaysia and has worked in community watershed management projects since 1999, and has extensive experience in participatory mapping, conducting community awareness workshops, enrichment planting, gravity water supply systems, and micro-hydro initiatives. He has twice received the Outstanding Young Person Sabah award for his work integrating natural resource management and rural indigenous communities.

Penampang Renewable Energy (PRE)

Gabriel Sundoro Wynn is the director of Penampang Renewable Energy Sdn. Bhd, where his work focuses on building the capacity of rural communities in constructing, financing, and managing their own renewable energy systems. He develops decentralised clean energy systems in Southeast Asia that are integrated with watershed conservation and rural water supply. As Green Empowerment's Asia Regional Director, he works closely with local renewable energy practitioners and indigenous community groups seeking energy security and livelihoods that support a conservation vision. In this capacity, he has overseen the development of over 50 community-managed mini-grids and water systems in four countries, and co-founded the Centre for Renewable Energy and Appropriate Technology (CREATE Borneo).

Scope of Project

Project Objectives

- To obtain insights into the long-term value of electrification for rural off-grid communities, and the methods to make electrification a reality.
- To identify the development needs of rural Sabahan communities, and to place these needs into the wider context of rural development in Sabah.
- To produce a viable business model that provides routes to electrification and broader socioeconomic development for rural off-grid communities in Sabah.
- To consider the views of key stakeholders, particularly rural communities to develop an inclusive model.
- To balance a strong social mandate with realistic capital flows and projections for a financially sustainable model.
- To have a governance model that is transparent to all stakeholders.

Methodology for Field Project

- Site visits, meetings and focus groups with a diverse array of stakeholders.
- Collection and analysis of relevant data to support information from site visits and stakeholders. Consolidation of findings in business planning sessions to develop a large-scale, long-term, and self-sustaining business model.

Key Stakeholders

- Government site visits – Consultation with several government agencies, including MESTECC, SEDA, and SESB.
- Private enterprises & foundations – Discussions with PACOS, Forever Sabah, JOAS and CREATE.
- Community visits – Engagement with residents of rural off-grid communities, centred around kampung Tiku and Buayan, just 20 kilometres from Kota Kinabalu

Outcomes

- Generation of a business proposal with five key focus areas: Business Model; Operations and Strategic Partnerships; Organisational Structure and Governance; Social Impact; and Financial Analysis.
- Public presentation of highlights of the core business plan to representatives from the government and financial institutions at a forum on 25th April 2019.

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Overview of Sabah

Sabah is the second largest state in Malaysia, located on the northmost side of Borneo Island, and has a population of over 3.8 million. Due to its large size and low population density, the majority of Sabah's settlements are spread across the coastline to take advantage of sea-based resources and ocean trade routes. Nonetheless, it is believed that up to 40% of the population lives in rural communities. The economy is divided between primary and tertiary sectors: mining and quarrying (29.6%) and agriculture (19.1%) for the former, and tourism (11%) for the latter.

Because of its abundance in natural resources, its main exports are oil, gas, palm oil and timber. Despite excessive logging for the timber industry, over half of Sabah's landmass is a dedicated reserve.

These reserves help to conserve Sabah's massive biodiversity, which contributes to Malaysia's status as one of 17 mega-diversity countries. The combination of reserve legislation and indigenous land rights results in particularly complex land protections laws for Sabah's rural regions.

Sabah Factsheet:

- Population: 3.8 million (2nd largest in Malaysia)
- Human Development Index: 0.674 (lowest in Malaysia)
- Capital: Kota Kinabalu
- GDP: RM 80.2 million (6th in Malaysia)
- Unemployment: 5.4% (highest in Malaysia)

Sabah's natural resources are incredibly rich, and are the fundamental driving force of its economy

Current Situation & Challenges

Electrification Landscape in Sabah (1)

Sabah Electricity Sdn Bhd (SESB) is responsible for the generation, transmission, and distribution of electricity in Sabah. It is responsible for the fully integrated East and West Coast grid system that has brought electricity to urban hubs across Sabah's coastline. Of its near 900-megawatt capacity, over three-quarters is generated from natural gas sources, with just over 40% of said capacity stemming from Independent Power Producers.

The Sabah government and SESB have attempted to electrify all of Sabah, with projects that aim to expand the grid system into regions that lack electricity supply, namely rural village communities.

A major manifestation of this is a rural electricity supply scheme called the Rural Electrification Programme or Bekalan Elektrik Luar Bandar (BELB). The BELB programme is enacted in two ways: firstly, increasing the connection points of the grid by developing transmission lines; and second, through the funding of isolated on-site supplies such as diesel generators, diesel-battery hybrids and solar-diesel-battery hybrids.

These decentralised and stand-alone systems are favoured in rural villages: diesel generators used to account for around 50% of rural energy production in Sabah. Between 2010 and 2017 with these methods, a total of 29,260 households from 699 villages in the state benefited from access to electricity.

Recently, in mid-2018, it was announced by BELB's Chief Engineer Ir Saudi Wahab that RM1.64 billion (USD402 million) has been allocated to aid SESB in six major projects.

These include:

1. Extension of the 132-kilovolt grid line.
2. 33-kilovolt line construction.
3. 11-kilovolt line construction.
4. Diesel Generation Project.
5. Village Road Lights.
6. Solar Hybrid Project.

Electrification Landscape in Sabah (2)

There are national schemes that contribute to the electrification of rural Sabah. Here are three of the most prevalent:

Agency	Initiative	Activity
MESTECC	Renewable Energy Act and Action Plan 2010	• Establish generation targets until 2050 when renewable energy should make 24% of the total energy mix
SEDA	Renewable Energy Act 2011	• Development of *Sustainable Energy Development Authority* (SEDA) as the "implementing agency" • Introduce feed-in-tariff (FiT) and REF mechanisms
GreenTech	Green Technology Financing Scheme 2010 (GTFS)	• Development of GreenTech as the conduit for GTFS scheme to benefit companies who are producers and users of green technology. • Government will bear 2% of the total interest/profit rate • Government will provide a guarantee of 60% on the financing amount via Credit Guarantee Corporation Malaysia Berhad (CGC)

Despite these efforts, there is a discrepancy in the consistency and volume of electricity supply in Sabah as a whole: the System Average Interruption Duration Index (SAIDI) average is 241 minutes, which is four times as high as peninsular Malaysia.

This is because SESB is grappling with the problems of aging facilities, years of under-investment and financial difficulty, while balancing existing demands with the planning and executing of future-need projects. As an example: most of the transmission and distribution network development projects have to be supported by the Malaysian government due to the fact SESB largely operates at a loss.

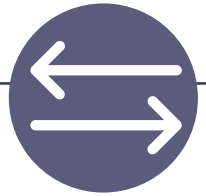
Federal and State-level government funding is being channelled into Sabah's electrification, but gaps in performance exist nonetheless

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Key Challenges for Off-Grid Communities

Rural settlements of inland Sabah comprise a diverse collection of traditional villages that operate with limited integration with urban regions along the coast, resulting in over 600 villages without sufficient access to electricity – this is in excess of 20 thousand houses. However, lack of electricity provision is just one manifestation of a deepening rural-urban divide, with a wider socioeconomic lag that must be addressed if rural Sabahans are to be presented with equal opportunities for growth.

As such, an inclusive business model that implements a scaled-up rural development program in an efficient, transparent and sustainable manner is required to address current systemic challenges while also preserving the unique way of life present in these rural communities. Such challenges include:



Accessibility

Villages suffer from geographical isolation. They have very low population density and are widely dispersed (0.01 person per square km in Sabah vs 94.7 people/square km in peninsular Malaysia), This results in substantial access challenges for road network construction, grid extensions, and telecommunication coverage.

Economic Opportunities

Despite carrying out numerous possible revenue-generating activities on a day-to-day basis, from food preparation to herbal expertise provision, the inhabitants of off-grid communities have little to no access to education on how to leverage the potential of their traditional crafts, or how to embrace new income opportunities.

Health and Education

Access to appropriate healthcare facilities and rigorous education services is inadequate in rural communities. The need for local provision of both is paramount given the limited access to urban centres. In particular, education will open opportunities for future generations to contribute to the economic success of the villages.

Quality of Life

Lack of integration with the rest of Sabah means that isolated villages are not yet capable of enjoying high standards of living, They also rarely benefit from public amenities and services that the government provides as standard for urban regions, such as sanitation and sewerage systems.

Rural-Urban Migration

Brain-drain is a serious issue for rural Sabahan communities, as the village youth see more potential in living in urban centres for better income, lifestyle, and standards of living. This leaves villages depopulated, with a cascade of impacts that range from less capital for settlement regeneration to decreasing populations over time.

Business Model

Business Model Objectives

Given the gaps in current government initiatives and the challenges facing rural communities in Sabah, a business model was designed to address the overlap of both. The proposed business model is centred around the establishment of a Government Linked Company named **SinaRaff** with a focus on rural development in Sabah. Its mandate will be to provide renewable, affordable energy to communities in the short-term; and education, healthcare and communications in the long-term. It has the following objectives:

1. The establishment of a new Government Linked Company (GLC) called **SinaRaff** that will have a mandate to take a holistic approach to rural development in Sabah. This mandate includes the provision of renewable, affordable energy, accessibility and communications in the short-term; and education and healthcare in the long-term. Meeting these goals will be aligned with the Masterplan for Rural Electrification and Development for Sabah. Within the first 5 years of its operations, **SinaRaff** will provide renewable energy and road access to **200 villages**, impacting over **6,500 households** as well as creating over **1,500 jobs.**

2. **SinaRaff** will act as an interface between funding, policy and implementation, with an efficient and transparent governance structure: in essence, a professional management organisation that unlocks key government resources and policy advances.

3. The creation of a funding mechanism will be through a rural development foundation called **Yayasan Bayu**. It will run an Endowment Fund that relies on an initial government grant, and will be sustained by a proposed Rebate for Eco System Services (RESS) levy and private sector grants. The RESS is a Payment for Ecosystem Services (PES) mechanism sourced from a levy on a range of extractive industries operating in resource-rich rural areas.

4. The formation of an ecosystem of local SMEs to implement the development goals of **SinaRaff**. These SMEs will be involved in the manufacturing and installation of renewable energy systems and mini-grids; the construction and maintenance of roads and telecoms infrastructure; and the provision of education and healthcare. This SME ecosystem will have the added benefit of job creation for local residents.

5. Setting up a Centre of Excellence (CoE) that builds capacity within communities through knowledge transfer between **SinaRaff**, SMEs, civil society partners and villagers. The ultimate aim of the CoE is to create world-class appropriate technologies and equip local communities with the skills required to own, maintain and operate the newly installed infrastructure.

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Introducing SinaRaff

Vision

Catalysing rural development by addressing the key themes of rural electrification, accessibility and communication in an efficient, transparent and sustainable manner.

Mission

Leveraging on a community based model to co-create a resilient, rural eco-system of SMEs and community-based organisations that empower rural communities.

SinaRaff

Powering Sustainable Prosperity

Sinar (noun) : In the Malay language, *sinar* means a ray, beam, or glow.

Rafflesia : The largest flower in the world, indigenous to Borneo & Sabah.

SinaRaff aims at delivering rural development through extensive involvement of rural communities

GIFT GLOBAL INSTITUTE FOR TOMORROW.

SinaRaff Core Principles

Professionally-Managed

- **Managed by Professionals**: The company will be run and managed by professional who will be hired at market rates to ensure good performance.
- **Key governance**: Proper check and balance will be in place to reduce risk of corruption and malpractice.

SinaRaff
Powering Sustainable Prosperity

Transparent

- **Award by Tendering**: Any selection of service contractors will be on an open tender basis to ensure fair pricing.
- **Cost-effective models**: The implementation will be via an open-book cost price basis with 5% contingency. The contingency is for maintaining daily operations of **SinaRaff**.

Community Focused

- **Government Linked Company** (GLC): **SinaRaff** will be a newly established GLC governed by a diverse group of stakeholders and guided by relevant government bodies.
- The intention is not to maxisimise profit but to remain financially sustainable with the sole focus of meeting the development needs of Sabah's rural population.

Sustainable

- **Recurring independent funds**: To reduce dependency on government grants, **SinaRaff** will leverage on annual capital appreciation from the endowment fund.
- **Right partnerships**: The entity intends to deliver positive impact to the Rakyat through working closely with strategic partners such as PRE, which have local expertise and established community engagements.

SinaRaff's core principles marry ethical governance and operations with financial and social sustainability

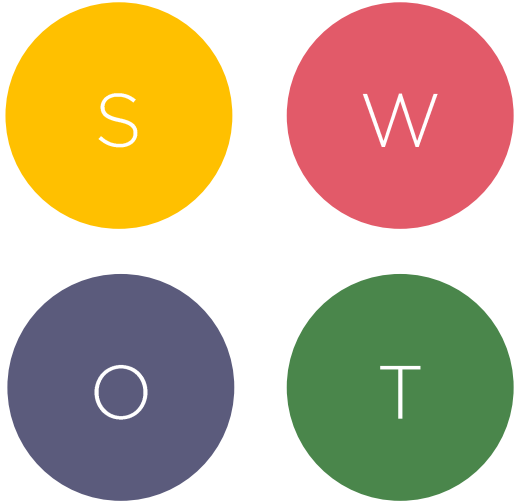
GIFT GLOBAL INSTITUTE FOR TOMORROW.

Value Proposition of SinaRaff

SWOT Analysis of SinaRaff

Strengths

- Strong governance in place to ensure efficient management of funds.
- Sustainable source of financing via an independent endowment fund.
- Community-based model to ensure direct benefits for communities.
- Leveraging on partners who have over twenty years of experience in community-based projects.



Weaknesses

- Requires significant start-up capital to establish the entity and initial program.
- Dependent on initial government grant until the endowment fund matures.
- Reliance on strategic partners to fulfill key areas of the plan.

Opportunities

- A clear need for sustainable off-grid energy solutions in Sabah.
- Support from policy-makers in Malaysia's new government.
- Need for affordable energy and infrastructure accessibility to stimulate rural business.

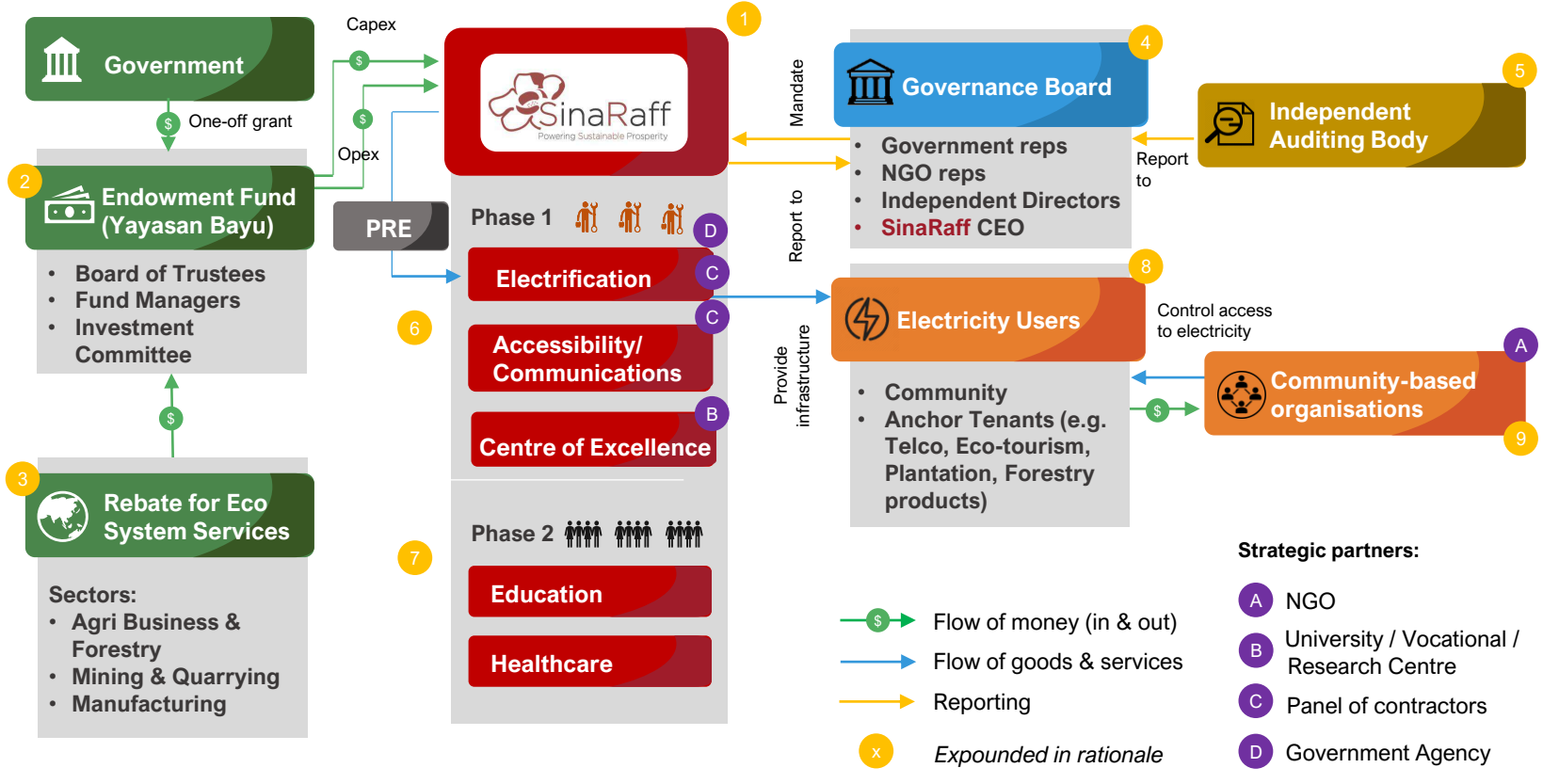
Threats

- Vulnerability to changes in government policy.
- Maintaining project quality control at scale is a challenge.
- Risks associated with the mismanagement of community systems.
- Challenges associated with accounting for demand growth.

SinaRaff is well set-up to address existing gaps and sees significant opportunities to develop the rural community

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Proposed Business Model



Business Model Rationale

1. **SinaRaff** is a newly established Government Linked Company mandated to address rural development in Sabah by delivering accessibility and electrification in an efficient and effective manner.

2. **SinaRaff's** capital requirements will be financed by an **Endowment Fund** sourced from government grants and Rebate for Eco-system Services. The funds will be supervised by a Board of Trustees and a portion of the capital raised will be placed in the purview of a professional **Fund Manager**.

3. RESS is a 1% levy on revenues of companies with high environmental and social impacts on rural economies and will contribute to the endowment fund. These companies also stand to benefit in the long term from improved rural infrastructure and a higher skilled workforce.

4. A Governance Board with multi-sector representation that is guided by independent third-party experts that will oversee the mandate of the GLC and will report regularly to the board.

5. The **Independent Auditing** body will report on **SinaRaff's** operations and financials to the board to ensure that it remains transparent and efficient.

6. Phase 1 of the model will focus on providing electricity, accessibility and communication. In order to achieve this, **SinaRaff** relies on strategic partnerships with SMEs and NGOs with local expertise.

   PRE will be the lead partner for the electrification initiative and will manage the installation and maintenance of the energy systems.

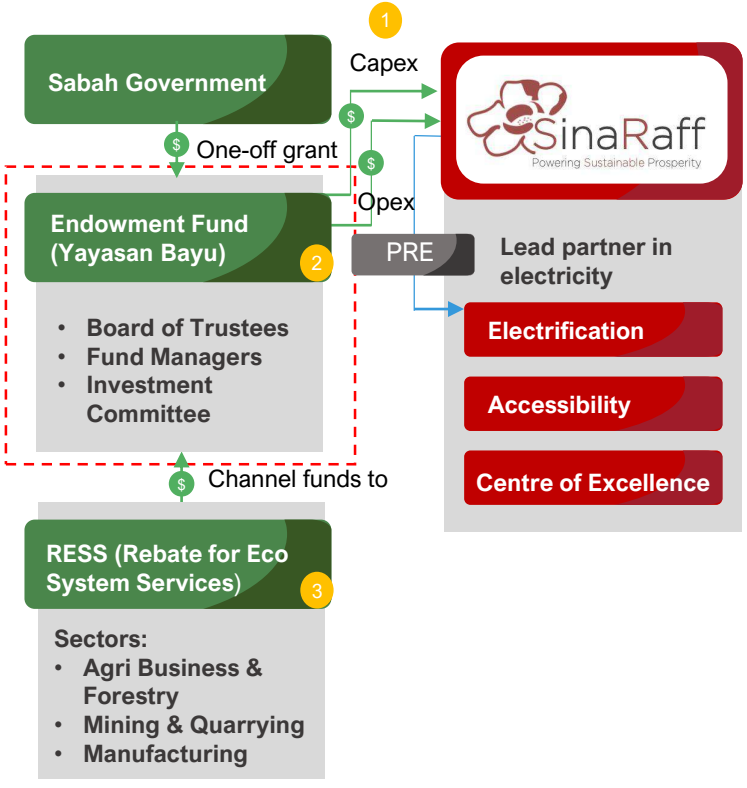
   A Centre of Excellence will also be established and will leverage on existing training centres in order to upskill members of local communities who will contribute to the ground operations of **SinaRaff**.

7. Phase 2 of the model will expand on the operations of phase 1 by cooperating with various ministries, SMEs and NGOs in order to provide innovative and appropriate access to healthcare and education.

8. Rural communities will be the primary consumers of electricity while any excess amount can be sold to anchor tenants.

9. **Community Based Organisations** will be set up in order to ensure community buy-in, ownership and equitable benefit-sharing from planned projects.

Funding Mechanisms: Endowment Fund



1 Government Grant

- The Malaysian and/or Sabah Government provides an initial seed funding to the entity to cover the capital expenses of setting up the organisation.
- **SinaRaff** will optimise the management of allocated funds through regular evaluation of performance indicators that measure impact-for-cost.

2 Endowment Fund

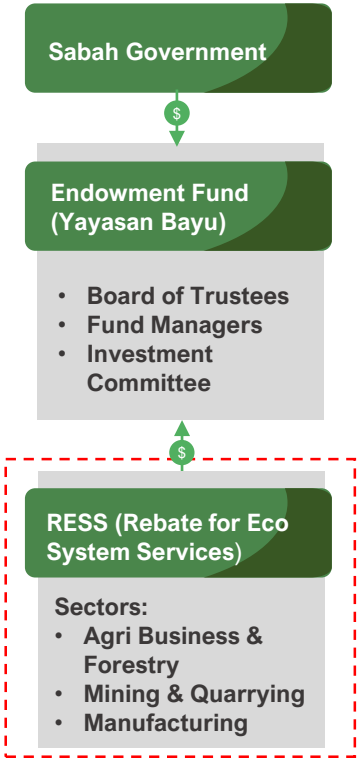
- A one-off grant obtained from government and social impact investors
- Professionally managed by Fund Managers that are responsible for meeting targets on return-on-investment.
- Investment dividends to be channeled to **SinaRaff** based on Investment Committee approval.

3 Rebate for Eco-system Services

- A new policy will be enacted to charge extractive companies operating in rural Sabah a 1% tax for the ecosystem service they are profiting from, be it timber harvesting or water drawing.

The Endowment Fund will channel all funds that feed into SinaRaff, including capex and revenue for opex

Funding Mechanisms: RESS



- RESS is a form of Payment for Ecosystem Service (PES). Broadly, PES mechanisms rely on the identification, quantification, and payment of the functions that ecosystems contribute to the human and natural spheres. The payees are usually governments and private ogranisations, whilst the recipients can be governments and communities. Globally, over 550 PES mechanisms are in operation, generating an annual revenue of USD36 billion in 2018.

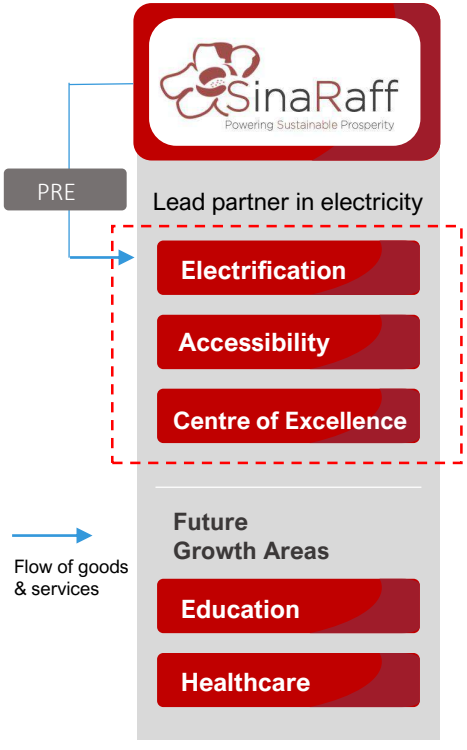
- Ecosystem services are divided into:
  - Supporting services – processes that create the conditions required for fundamental ecosystem services, such as photosynthesis or soil formation
  - Provisioning services – products that ecosystems deliver, such as food, fuel, medicine, and drinking water
  - Regulating services – processes that regulate important environmental factors, like climate, quality and quantity of water, air quality, ocean salinity and so on
  - Cultural services – the immaterial benefits from ecosystems, like the aesthetic, recreational, and spiritual value of landscapes

- Various forms of PES have already been piloted in Sabah to cover the costs of managing forest reserves and water catchments. For example, land use regulations through the Malua Biobank, which sells Biodiversity Certificates that represent 100 square metre protection zone in Sabah's rainforests, or the Innoprise-Face Foundation Rainforest Rehabilitation Project (INFAPRO) that carries out a carbon cap-and-trade.

- With this in mind, the proposed RESS collection will be a 1% levy placed on the revenue of companies that operate in rural regions and which are involved in extractive industries, such as mining, quarrying, forestry and agribusiness. It is hoped that alongside providing long-term revenue for **SinaRaff**, RESS will also place a check on extractive industries to prevent them from exploiting Sabah's rich natural resources.

The 1% RESS levy will contribute to the financial sustainability of SinaRaff and discourage over-extractive industries

Phase 1: Electrification, Accessibility, and COE



Phase 1 of the project has 3 main focus areas: 1) Electrification, 2) Accessibility and 3) Centre of Excellence. The focus areas will be carried out in tangent to the conclusions of the Masterplan for Rural Electrification and Development for Sabah, to most effectively direct state resources.

Electrification

- Micro-hydro and solar systems will be installed and connected to form mini-grids, which will be the backbone of providing rural communities with electricity independent to the national grid.
- Rural communities would be the key consumers, paying fair and transparent tariffs that are set and collected by the Community Based Organisations.
- PRE will be a lead partner in the planning, execution and maintenance of the mini-grids.

Accessibility

- Current roads will be upkept and new roads will be constructed, and communication infrastructure will be set up.
- This has the double-effect of addressing the major issue of communities' isolation while also providing routes for electrification partners to accelerate the installation of mini-grids in previously inaccessible regions.
- Related agencies to provide support are JKR and PBT

Centre of Excellence

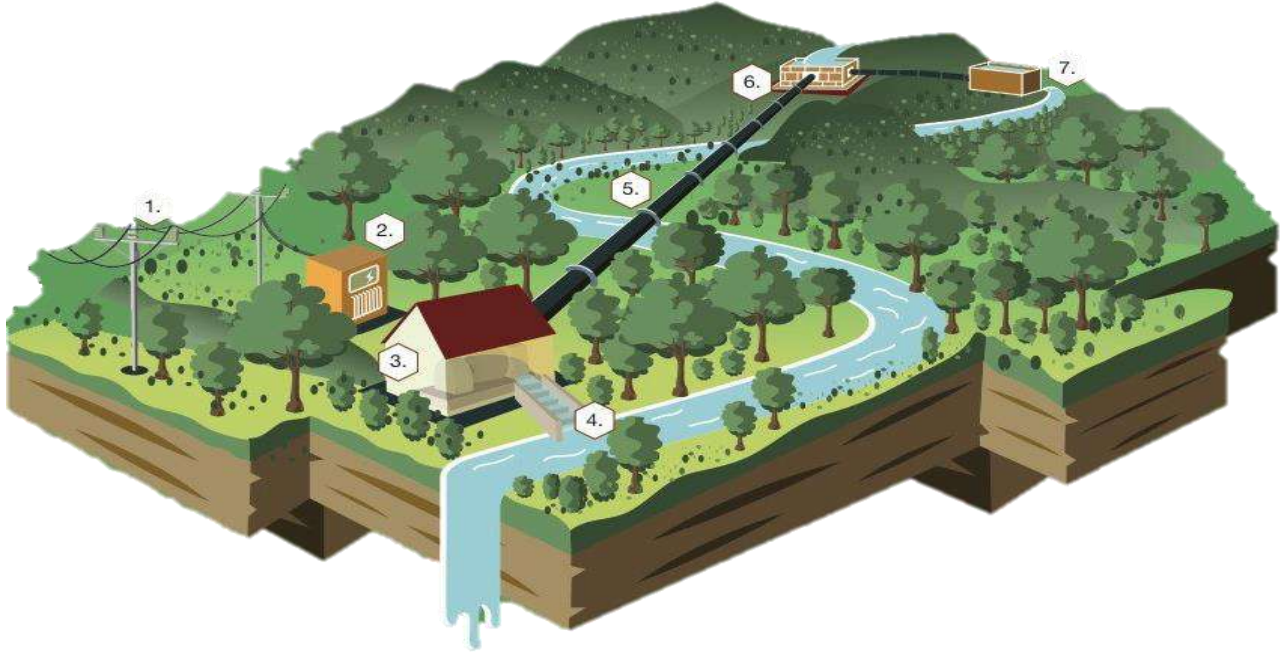
- This is a necessary component to ensure a sufficient community-sourced workforce is developed for the scalability and sustainability of electrification and accessibility projects, as the community is expected to own and operate the mini-grids.

- It will provide following services:
  - Training for rural community members. Initially specific mini-grid
  - Cooperation with university and vocational Schools; eg UMS, Polytechnic, ILP to provide access to teachers, materials, syllabuses, student exchange, and Train-the-Trainer programmes.
  - Innovation through research and development, and technology sharing with local to global partners.

Coupling electrification with road accessibility and targeted vocational training will help meet SinaRaff's mandate for rural development

Phase 1: Micro-hydro Systems

Micro-hydro electricity generation systems can be installed in small rivers or streams, and typically produces between 5 kW to 100 kW of electricity using the natural flow of water.



1. Transmission lines
2. Transformer
3. Power house
4. Tailrace
5. Penstock
6. Forebay
7. Intake weir

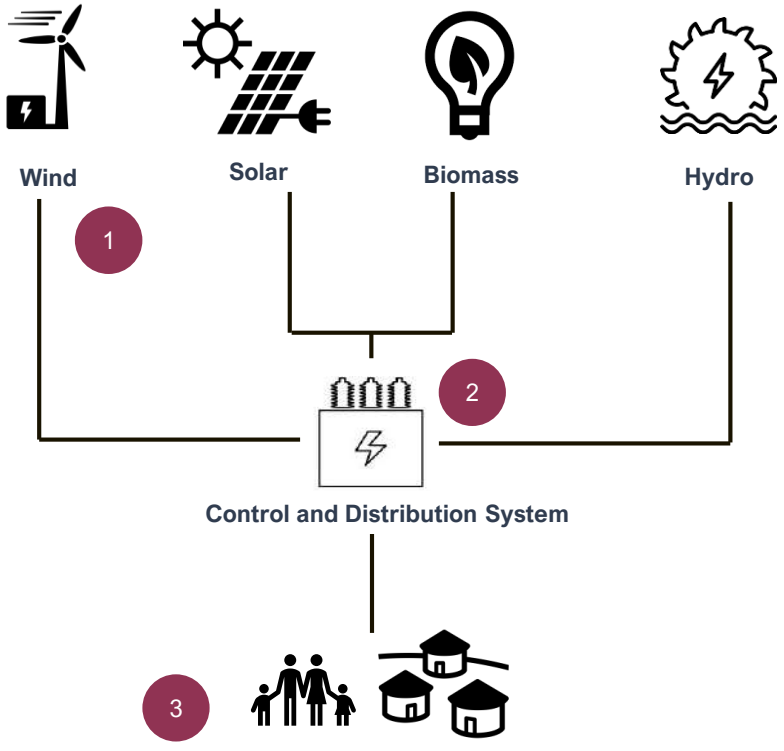
An example of a micro-hydro system is presented in the diagram opposite.

It works by drawing water from an intake at a higher upstream location, and separating sediment in a forebay (6). A penstock pipe (5) transports the water to a power house (3), which contains a turbine that converts the kinetic energy of the flowing water into electricity. A tail race (4) returns water to the original stream, minimising impacts on downstream water users and ecosystems. A transmission line (1) delivers electricity to the consumers.

With micro-hydro systems, no two sites are the same, and PRE custom designs its turbines to suit the characteristics of each stream or river.

Phase 1: Mini-grids (1/2)

Renewable energy sources and mini-grids are essential components in the electrification process and overall mandate of **SinaRaff**. A brief explanation follows.



A mini grid, also sometimes referred to as an isolated grid, is most commonly defined as set of electricity generators interconnected to a distribution network that supplies electricity to a localised group of consumers. They involve small-scale electricity generation (10 kW to 10MW) that normally run independent to the grid, but some can be connected to the grid if the correct parameters are in place.

1. Local energy sources including micro-hydro, solar, wind, and biomass all generate electricity. One or all of these sources can be used, and there is an additional option to be connected to a major grid system.

2. The electricity is transmitted to a control and distribution system to regulate frequency of electricity supply.

3. There, the electricity is transmitted to households, hospitals, businesses, to the main grid and so on.

Mini-grid systems can be based on different kinds of energy resources, and can be tailored to suit what is most available at a given locale

Phase 1: Mini-grids (2/2)

In the **SinaRaff** business model, mini-grids are a necessity due to Sabah's utility grid being unable to reach rural communities. However, mini-grids also possess a number of benefits, as follows:

Factor	Benefit
Severe Weather	The growing concern that weather-related disruptions will become more frequent and more severe over time due to climate change creates a sense of urgency to addressing grid resilience. Microgrids can provide power to important facilities and communities using their varied generation methods when even in the event that one or more sources of electricity are affected by weather.
Cascading Outages	Because electrical grids are run near critical capacity, a seemingly small problem in a major grid can lead to a cascade effect that takes down an entire part of the grid. Microgrids alleviate this risk by breaking the grid into smaller functional units that can be isolated and operated autonomously if needed.
Fuel Cost	Microgrids offer several ways to improve efficiency, including reduced loss through transmission; combined heat, cooling, and power; and can be more readily designed to accommodate renewable energy sources, cutting the fuel cost to zero.
Variability factors	Major renewable energy sources such as hydro, solar, and wind are all variable and non-controllable, which can cause challenges like overgeneration, under generation, and voltage control problems for grids if employed in large quantities. By contrast, microgrids are designed to handle variable generation, using storage technologies to locally balance generation and loads.
Stabilising features	When connected to a larger grid, microgrids reinforce the grid's infrastructure in case of a power outage. On-grid microgrids provide constant power to a limited number of connected customers. These customers may be willing to pay a premium for ensuring they are a part of a "reliability zone," where the grid is always available.

Phase 1: Process Flow

Feasibility Study

A detailed feasibility study will be conducted at village level to ensure that community readiness, requirements, local land sensitivities (culture and land rights) are taken into account, as well as aligning with existing blueprints, such as the ongoing Masterplan for Rural Electrification and Development for Sabah. It will be conducted in partnership with strategic civil society partners such as PRE (electrification) and JKR Class A contractors (road development) to produce an accurate 5-year implementation plan.

Acquire Funds

The Endowment Fund will be set up, and approval of the required funds granted. RESS tax process initiated.

Open Tender

Open tender balances transparency and fairness in awarding the electrification and road construction contract with optimum Total Cost of Ownership.

Implementation

Engaging with the local SME ecosystem to construct and install the energy systems and road network. It will be a requirement that 30% of the work force are community members.

Productive End-Users

Electrification only: Socioeconomic activities that utilise newly available affordable energy from mini-grids are known as productive end-users

Centre of Excellence

An educational facility set up with collaboration from local academic institutions to train local individuals on energy system operation and road maintenance

Maintenance

Trained community members will be responsible for the upkeep of the energy and road systems in the long-term

These activities can be key in building a case for the commercial viability of mini-grids. Activities are divided into three classes to indicate the potential of their economic contribution to the grid. Productive End-Use classifications are as follows:

Class 1: Community Cottage Industries

Community-run micro-enterprises that already operate in rural communities and serve their residents, but will benefit from affordable energy.
Examples: Rice mills, sundry shops.

Class 2: Community Social Enterprises

New community-run micro-enterprises that can emerge with support as a result of having access to affordable energy.
Examples: Small workshops, tailors, bakeries, cold storage.

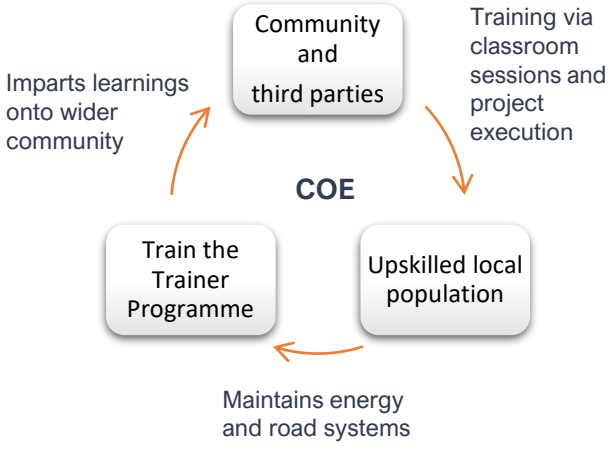
Class 3: Anchor Tenants

Small-to-medium sized rural enterprises who subsidize the operating costs of the mini-grid, but whose markets exist outside the community.
Examples: Coffee/tea producers, eco resorts.

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Phase 1: Community Ownership Model (1/2)

The community ownership model comprises the joint efforts of the Centre of Excellence and the Community Based Organisations. The COE is an essential component for scalability and sustainability of **SinaRaff's** operations as it ensures that there is sufficient skilled workforce to support the implementation of its mandate and a knowledge-sharing culture. Meanwhile, the CBO delivers community ownership and equitable benefit-sharing of **SinaRaff's** projects. Local NGOs are vital to securing community trust and participation in the CBO.



Centre Of Excellence (COE)

- Target trainees include:
  - Community members responsible for implementation, operation and maintenance.
  - Non-community members who will be trained as project supervisors and managers.
  - College students or volunteers who wish to gain experience in order to improve employability.
  - Others beyond Malaysia with the right interest and know-how.
- Partnership with academic institutions, vocational schools, as well as PRE and other NGOs with existing training schemes to leverage current educational resources for vocational and non-vocational subjects.
- Employ "Train the Trainer" programmes for community members to create a virtuous circle by assigning trained individuals to train the wider community.
- Phase 2 involves innovation and research & development towards improving the efficiency of which rural energy is utilised through grid interconnection, productive end-uses, communication and IT

Community Based Organisations (CBO)

- Members of the community who are organised by COE to operate and maintain the energy systems and road networks.
- The CBO will determine the electricity tariff and tariff collection via a prepaid metering system.
- Foster relationships with Anchor Tenants.
- Collected tariffs will be used to maintain energy systems
- Demand for electricity has been identified prior to installation by panel contractors with projection of long term sustainability and growth population.

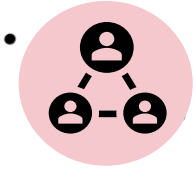
GIFT GLOBAL INSTITUTE FOR TOMORROW.

Phase 1: Community Ownership Model (2/2)

For the long-term success of the Community Ownership Model, it is imperative that communities own, operate and maintain all mini-grid systems.

Contracting

Construction - The ecosystem of SMEs will collaborate to construct and install the mini-grid systems across planned locations in rural Sabah. This will be done in tandem with accredited experts who will help oversee the construction and maintenance of the mini-grids, and assess that they are operating to standard. Community members will be employed to help with construction.



Ownership – After construction, a contracting process will guarantee the communities' ownership of the mini-grids, as per the mandate of **SinaRaff**. Iinitially, communities will own 51% of these installations, making them the majority shareholder, which will encourage community participation and discourage the SMEs from taking advantage of their share of ownership.

Accrediting

Collection – As tariff collection for electricity falls under government purview, there are currently strict rules and regulations which must be met in order to collect tariffs. As such, each mini-grid will need to be accredited before tariffs are charged. When accreditation is secured, the collected tariffs will be channelled through **SinaRaff** for the purpose of increasing community ownership from the 51% baseline. Policy recommendations from this report aim to liberalise the energy sector for off-grid systems to enable communities to secure accreditation for effective tariff collection.

Licensing

Maintenance – Finally, the coupling of steadily increasing ownership and higher participation levels in operating the mini-grids will put communities in a position to take over maintenance. The COE will play an integral by supplementing on-the-job training for community members employed to service the mini-grids, enabling them to meet standards and obtain an operating license to maintain the systems in the long-term.

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Phase 2: Education and Healthcare

Once Phase 1 of the business model has been stabilised, Phase 2 will be enacted as a future growth area to cover additional essential features of rural development: education and healthcare.

SinaRaff
Powering Sustainable Prosperity

Electrification

Accessibility

Centre of Excellence

Phase 2

Education

Healthcare

Education

- The Centre of Excellence will be expanded to include a broader range of functions and responsibilities:
  a) To move beyond mini-grid specific education to improve the overall education level in rural communities through expended curriculum offerings. This includes traditional literacy and numerical skills alongside vocational courses.
  b) To provide syllabuses for age ranges that span from children to adults.
  c) To provide an education platform that existing private entities can add to, such as Kids Lab or e-Kelas.

- Cooperation with the Ministry of Education:
  - To improve the regulation and examination of curriculums to allow national-standard qualifications to be granted.
  - To provide educational staff and sophisticated teaching materials
  - To seek increased funding

Healthcare

- A healthcare initiative will be set up to further address the socioeconomic status and quality of life of rural communities. It will:
  a) Improve existing rural healthcare facilities with contemporary equipment and trained part-time staff
  b) To provide a new network of mobile clinics to leverage on the road network, equipped with surgical facilities to address basic medical needs
  c) To charge only a nominal fee for services provided

- Cooperate with Ministry of Heath and People's Wellbeing to:
  - Provide guidelines for best medical practice
  - Find skilled medical staff willing to work with **SinaRaff**
  - Gain access to the database of private medical companies that may contribute to the initiative

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Key Milestones

YEAR 0

- Formation of Yayasan Bayu with seed capital from Government.
- Establishment of **SinaRaff**.
- Investor Relations team and Endowment Fund Manager hired by Board of Trustees.

YEAR 1

- Set up of Centre of Excellence.
- RESS tax initiated.
- Provide electricity to 10 villages.
- Provide road accessibility to 10 villages.

YEAR 2

- Provide electricity to 30 villages.
- Provide road accessibility to 30 villages.
- Local community members begin maintaining and operating energy and road systems.

YEAR 3

- Provide electricity to 50 villages.
- Provide road accessibility to 50 villages.

YEAR 4

- Provide electricity to 55 villages.
- Provide road accessibility to 55 villages.

YEAR 5

- Provide electricity to 55 villages.
- Provide road accessibility to 55 villages.

200 villages to have access to electricity and road access by year 5

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Key Stakeholders and Strategic Partners

The table below lists the key stakeholders in the business model and their major contributions.

Stakeholders	Key Contributions	Interests
Government Agencies and Institutions (such as MESTECC, SEDA, JKR, UPEN)	• Provides funding. • Support mechanisms through policies and regulation. • Accesses to information and expertise.	• Steps towards government mandate of electrifying Sabah. • Socio-economic development of rural communities.
Educational Institutions (such as UMS, Polytechnics, Vocational Schools)	• Provides curriculum advice and educational support e.g. part-time teachers and train the trainer programmes for the COE.	• Brandings & goodwill. • Internship opportunities. • Student exchange programmes.
Private Companies (such as SMEs, International Engineering, Procurement, and construction firms, renewable energy consultants)	• Provides funds, construction and expertise. • Knowledge transfer through contribution to COE.	• Company brandings & goodwill. • CSR.
Civil Society Organisations (such as Tonibung, PACOS Trust, Forever Sabah, JOAS)	• Support the development and empowerment of off-grid communities.	• Reducing unemployment rate. • Promoting economic growth.
Financial & Corporate Supporters (such as telco, oil & gas, mining, high net-worth individuals etc.).	• Investments in Endowment Fund and capital expenditure for **SinaRaff**. • To collaborate with **SinaRaff** and contribute towards the rural development mandate.	• Company brandings & goodwill. • CSR. • To open up more opportunities to access bigger markets for entrepreneurs.
Communities	• Support the development and provision of social and community building • Contribute toward the long term maintenance and operations.	• Shared interest in the common goal of improving livelihoods in rural Sabah.

Coordination with strategic partners across different sectors will be key in effectively executing SinaRaff's mission

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Governance and Organisational Structure

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Why does Good Governance Matter?

Good governance means:

Conducting business with integrity, fairness and transparency to protect the interest of all stakeholders.

SinaRaff and associated organisations should comply with all of Sabah's laws; be accountable and responsible towards stakeholders; and commit to conducting business in an ethical manner.

Why does the proposal need a robust governance mechanism?

As the intended recipient of public funds, the entities concerned need to posses accurate and transparent information on the direction of funds with a clear mandate on the social impacts that are to be generated.

Strong governance is also essential for the accountability of **SinaRaff** in protecting the interests of the communities, partner SMEs, NGOs, and ministries; for accurately communicating the performance, growth and strategic plan of the organisation; and in ensuring the objectives of the organisation are met.

This section addresses the key governance challenges related to the management of the endowment fund, **SinaRaff**, and of key stakeholders.

Good governance ensures SinaRaff will achieve its objectives and drive rural development through legal compliance and transparency

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Governance Framework of the Business Model

The governance framework is established upon three pillars, each representing the diverse stakeholder interests represented in the model.

Governance Framework Objectives:

- To ensure agreed upon strategies are carried out in the most effective manner.
- To ensure invested funds are managed efficiently and ethically.
- To align and meet the objectives and expectations of key stakeholders and partners.
- To meet obligations to government and donors.
- To ensure a sustainable partnership with experts, implementing agencies and rural communities.

The operating entities of the business model are governed by three core principles: transparency, efficiency and independence.

Transparency

- Both Yayasan Bayu and **SinaRaff** are managed by professionals and subject to independent third party audits.

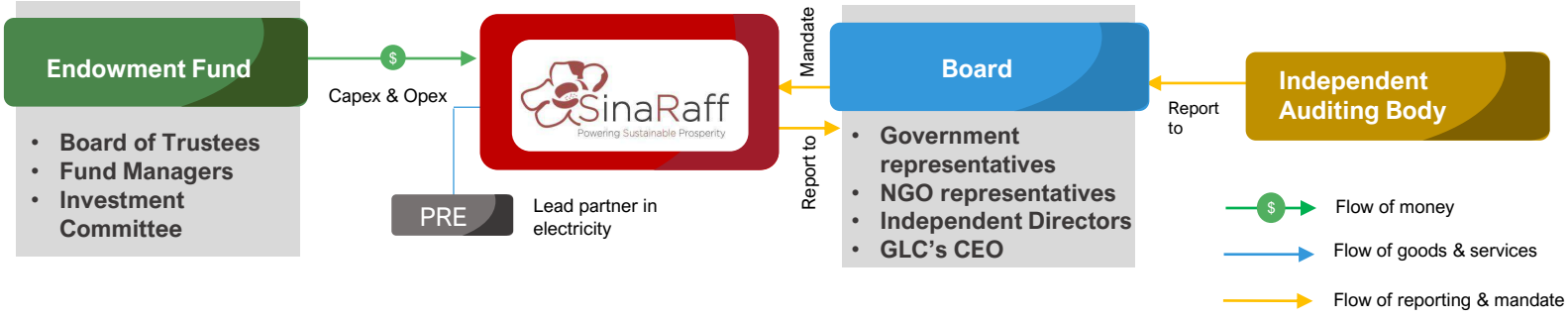
Efficiency

- **SinaRaff** and its SME network are guided by an experienced private sector partner, but are structured to reduce red tape typically associated with public project delivery.

Independence

- The appointment process for **SinaRaff** and Yayasan Bayu, and the governance of these organisations are accountable to the government, but independent from political influence.

Governance: Endowment Fund

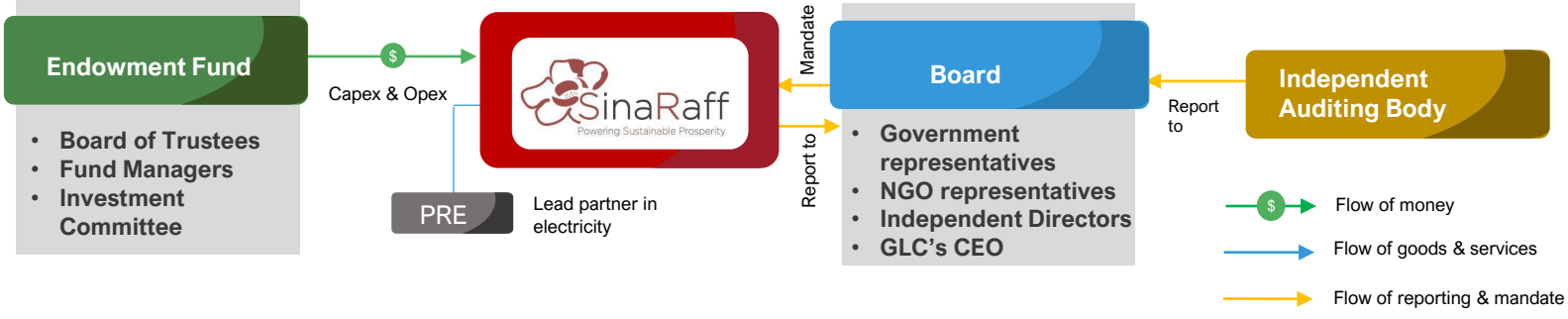


Proper governance measures must be in place to ensure Yayasan Bayu is managed effectively, with particular focus on achieving the agreed-upon investment returns to finance the operations of **SinaRaff**.

There will be two main bodies in charge of reaching this objective: the Board of Trustees and the investment Committee. The government and the **SinaRaff** Board of Directors will appoint the Board of Trustees, while the Investment Committee will be appointed by the Board of Directors and the CEO.

Yayasan Bayu Board of Trustees Responsibilities	Yayasan Bayu Investment Committee Responsibilities
• Hire and manage an endowment fund manager, which will guarantee incremental returns on the initial investment of government funds • Approve large-scale capital allocation requests from **SinaRaff** • Monitor and ensure the stewardship of financial flows out of the Endowment Fund into **SinaRaff**	• Take decisions on appropriate channels to invest endowment fund capital • Ensure investment returns are secured as per quarterly quotas • Grant approval for investment proposals • Ensure that all proposed investments align with the organisation's vision and mission

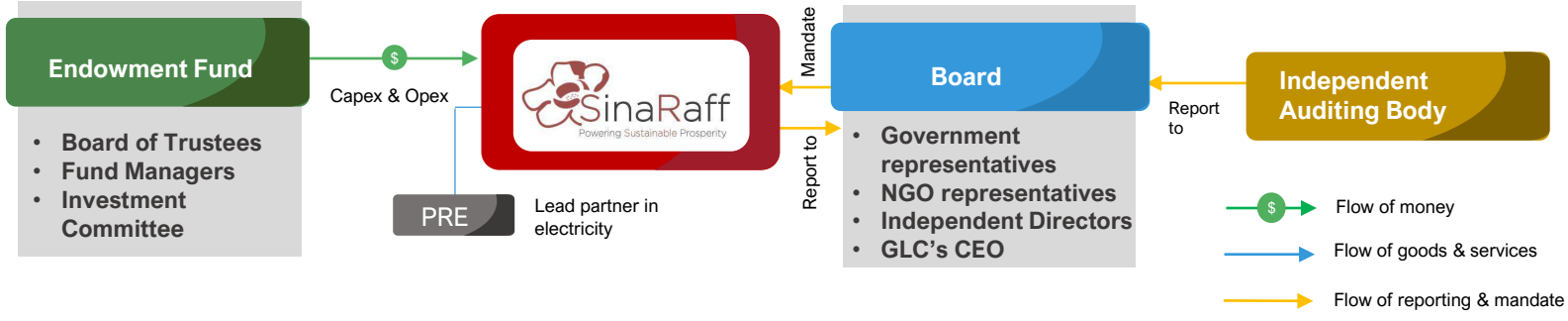
Governance: SinaRaff



SinaRaff is subject to one main governing body: the **SinaRaff** Board of Directors. The key purpose of this body is to ensure the company's prosperity by collectively directing the company's strategic plans, ensure all governance measures are in place, whilst also meeting the appropriate interests of its shareholders and stakeholders. The majority of **SinaRaff's** Board of Directors will be comprised of members who are Independent to the organisation. It is recommended to have local, Sabahan members on the Board.

Members of the Board	SinaRaff Board of Directors Responsibilities
• Related government bodies/agencies. • Local NGO representatives eg; PACOS, JOAS, Forever Sabah. • Management representatives from **SinaRaff**	• To better meet the needs of the full range of stakeholders through multi-sector representation (i.e. public, private, civil society). • To ensure all agreed plans and programs are delivered efficiently, from **SinaRaff's** management to SME network. • Review and approve the **SinaRaff 's** financial statements and financial reporting. • Review and approve **SinaRaff's** annual operating plans and budgets. • Monitor **SinaRaff's** performance and evaluate results compared to the strategic plans and other long-term goals. • Monitor relations with shareholders, employees, and the communities in which the organisation operates.

Governance: Independent Auditing



The main role of the Independent auditors is to identify and protect from fraudulent or unrepresentative financial claims, and to determine which areas of **SinaRaff's** operations require examinations for financial streamlining.

Independent Auditor Responsibilities

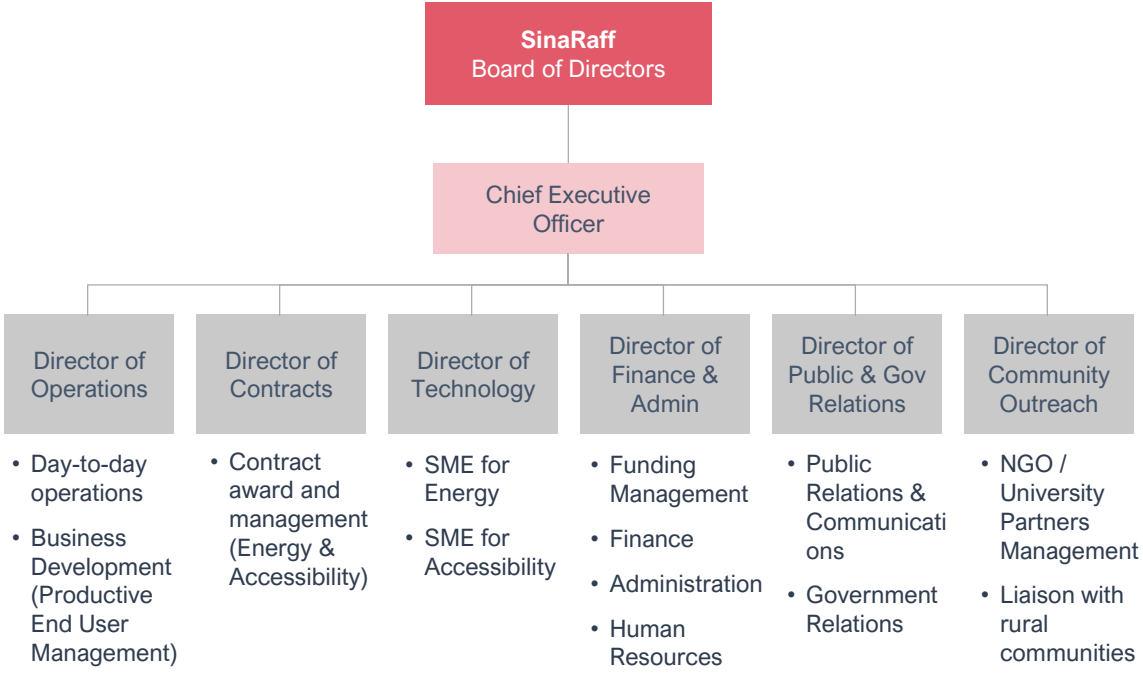
- Appointed by Jabatan Audit Negara.
- Ensure the organisation's financial systems and operations undergo appropriate third-party audits to guarantee compliance.
- The audits examine financial statements and related data, analyzes business operations and processes, and provides recommendations on achieving greater efficiency
- Identify and suggest the required policies and processes that will achieve optimum transparency for the endowment fund
- Present corrected financial statements that will be publicly published so all stakeholders are aware of fund allocation

SinaRaff Organisational Structure

Suggested Members for Board of Directors (7):

- 2 government representatives
- 2 NGO representatives
- 2 leaders from private sector
- CEO of **SinaRaff**

- The **Board of Directors** are the main governing body of **SinaRaff**.
- The **CEO** will have the overall responsibility of providing leadership in the strategic direction of the entity, supported by 6 main pillars:
  - Operations
  - Contracts
  - Technology
  - Finance & Admin
  - Public & Government Relations
  - Community Outreach
- A key feature of the organisational structure is its **ability to be scaled up quickly** based on the number of projects/ communities.



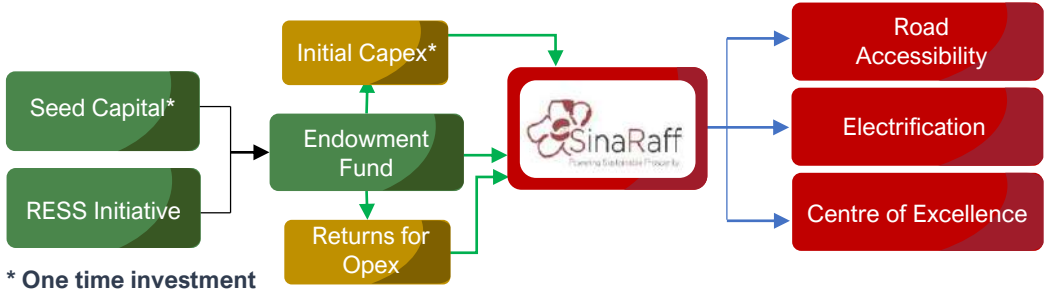
Key Roles & Responsibilities of SinaRaff's Management Team

Roles	Responsibilities
CEO	• Responsible for the overall strategic direction and performance of **SinaRaff**, based on the vision and mission. • Acts as a channel between Boards, partners and other key stakeholders • Ensure growth and value generation
Director of Operations	• Responsible for overall day-to-day operations of the entity • Sourcing and managing of Productive End Users
Director of Contracts	• Responsible on the review of all the tenders for energy and accessibility projects and decides on contract awards • Tracks and monitor progress of project implementation
Director of Technology	• Subject matter expert on technology on energy and accessibility • Support in the review of all the tenders for energy and accessibility projects
Director of Finance & Admin	• Tracks and monitors inflow and outflow of funds based on allocated budget • Manages employee relations, payroll and benefits
Director of Public & Government Relations	• Main point of contact between **SinaRaff** and the government for all policy and operational matters, including advocating with the relevant government bodies on policies impacting the entity • Manage all public relations matters and external communications of the entity
Director of Community Outreach	• Oversees the skills development of rural communities with partners • Main point of contact with key stakeholders in the communities to elevate quality of living

Financials

Summary

- This section presents a 10-year financial projection to substantiate the viability of funding **SinaRaff's** intended development of energy systems, road access, and education provision for the rural communities in Sabah through the establishment of an Endowment Fund through a foundation named *Yayasan Bayu*.
- The aim for this endowment fund is to generate investment returns sufficient to finance **SinaRaff's** operations without having to depend upon withdrawal of its principals in the long-term.
- Yayasan Bayu's model is built from an initial seed fund of MYR 250 million with a small portion of the fund (7.58%) allocated for capex in the preliminary year, and the remaining 92.42% (MYR 231.05 million) will be invested into the Fund. Thereafter, the fund will receive a yearly contribution from the RESS initiative to add to its pool of investable funds.



*** One time investment**

Financial Snapshot of Year: 10	
Accumulated no. of villages completed	475
Endowment Fund's returns made available for utilisation	MYR365m
Cost	MYR247m
Investable funds at beginning of year	MYR6.35b
Market value of Endowment Fund	MYR6.78b
Return on investment	6.77%

- In the first 6 years of its establishment, the development cost is partially financed through withdrawal of the principal as the investment returns are insufficient to fully meet demands for capital.
- However, year 7 will see this change as the fund becomes stable enough to generate an investment return exceeding the cost required. This continues for the upcoming years.
- In Year 10, the fund would have a profound market value of MYR 6.78 billion, with returns exceeding the initial cost by RM118m.

Key Financial Assumptions

COST

Average cost for electrification is MYR 800k per village.

Average cost for gravel road access is MYR 150k per km where 10km is planned per village.

Grant of MYR 30m is given to Centre of Excellence over the span of 10 years.

Contingency is assumed at 20% above Total Budgeted Cost to account for cost to build bridges and any other cost not accounted for.

The Endowment Fund's expenses is assumed to grow at 10%/year including inflation adjustments.

Inflation cost is assumed at an average of 2.30% per year

INVESTMENT

Remaining balance of MYR 250 million government seed fund after deducting capex for **SinaRaff** and Endowment Fund is invested.

Asset allocation mix of the Endowment Fund is 65% in fixed income (fixed deposit, corp bond, MGS bonds) and 35% in domestic equity.

Fund Management Expenses are allocated at beginning of year based on 1% of Total Pooled Funds and differential against actual will be transferred back to Investable Funds.

The GDP growth of multiple selected industries chosen for RESS is estimated at 6%/year.

1% RESS contribution from multiple selected industries growing at 6% GDP per year

OPERATIONS

SinaRaff is a non-profit organization, meaning excess income will be transferred to Yayasan Bayu for investment

In the case returns are insufficient, withdrawal of principal is required

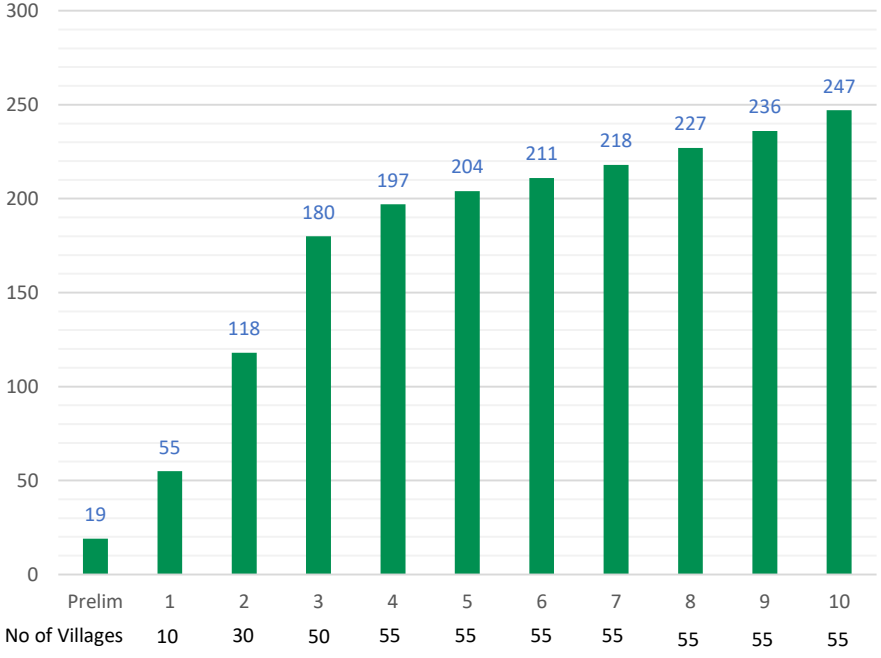
SinaRaff's capex costs are covered by the seed funding in pre-op year and by returns and principal for subsequent opex.

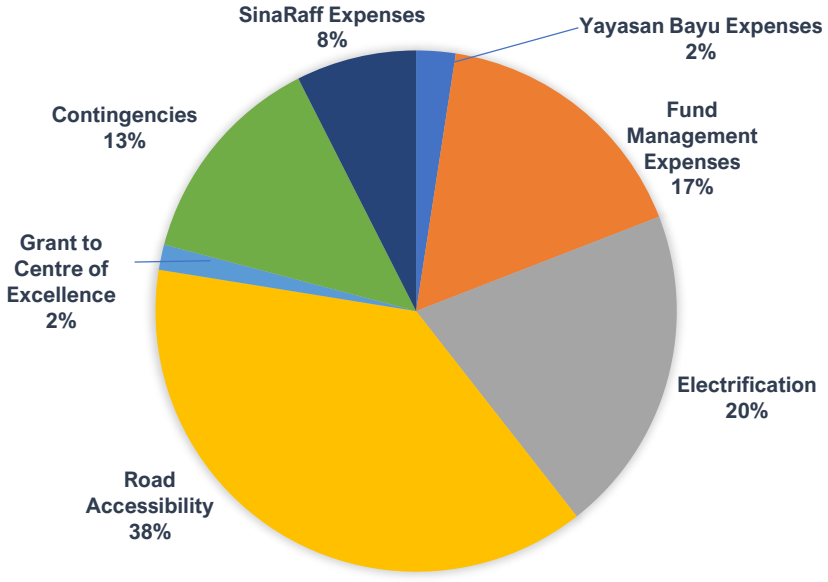
SinaRaff is assumed to not have any fixed assets other than furniture, fixtures and fittings.

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Cost Estimation

- In 10 years, the model assumes completion of planned development across 475 villages with a total cost of MYR 1.91 billion financed by the investment returns and principal (for the first 6 years) of Yayasan Bayu.
- The first milestone will be 200 villages in year 5 at a cost of MYR 569 million.
- While the targeted no of villages are constant (55 villages) from Year 4 onwards, the cost differs from year on year as the model accounts for inflation and contingency of 20% against the budgeted cost for the year.





- Providing road accessibility, electrification and education uses a major portion of the cost, accounting for 60% of the total seed fund.
- Contingencies represents 13% of the cost, which can account for construction of bridges or any other unforeseen costs.
- **SinaRaff's** office expenses accounts for 8% of the total cost while Yayasan Bayu only accounts for 2% due to its lean team.

Projection 1: SinaRaff's Cash Flow

In MYR'000	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10
Status of Operations	Prelim	First	Second	Third	Fourth	Fifth	Sixth	Stable	Stable	Stable	Stable
Cash In											
Withdrawal fr Y.Bayu Returns	0	12,395	41,764	70,824	99,728	131,595	167,474	174,617	175,740	175,749	177,050
Withdrawal fr Y.Bayu Principal	0	32,912	61,381	89,567	73,198	42,205	7,298	0	0	0	0
Withdrawal fr Seed Fund	13,504	0	0	0	0	0	0	0	0	0	0
TOTAL INCOME	**13,504**	**45,307**	**103,145**	**160,391**	**172,927**	**173,800**	**174,772**	**174,617**	**175,740**	**175,749**	**177,050**
Targeted No of Villages	0	10	30	50	55	55	55	55	55	55	55
Accumulated No of Villages	0	10	40	90	145	200	255	310	365	420	475
Cash Out											
(a) Rural Electrification											
Tender for Rural Electrification	0	8,000	24,560	40,933	45,027	45,027	45,027	45,027	45,027	45,027	45,027
(b) Expenses											
Space and Occupancy	276	276	276	276	276	276	304	334	367	404	445
Salary and Benefits	6,000	6,480	6,998	7,558	8,163	8,816	9,521	10,283	11,106	11,994	12,954
General & Admin Expenses	6,000	3,000	3,070	3,142	3,215	3,290	3,367	3,445	3,526	3,608	3,692
Total Expenses	12,276	9,756	10,344	10,976	11,654	12,382	13,192	14,062	14,999	16,006	17,090
(c) Accessibility											
Tender for Gravel Road Access	0	15,000	46,050	76,750	84,425	84,425	84,425	84,425	84,425	84,425	84,425
(d) Centre of Excellence											
Grant	0	5,000	5,000	5,000	3,000	3,000	3,000	2,000	2,000	1,000	1,000
Cost before Contingencies	12,276	37,756	85,954	133,659	144,106	144,834	145,643	145,514	146,450	146,458	147,542
Other Expenses (Contingencies)	1,228	7,551	17,191	26,732	28,821	28,967	29,129	29,103	29,290	29,292	29,508
TOTAL COST	**13,504**	**45,307**	**103,145**	**160,391**	**172,927**	**173,800**	**174,772**	**174,617**	**175,740**	**175,749**	**177,050**

Projection 2: SinaRaff's Income Statement

SinaRaff aims to achieve it's objective of providing electrification, road access and education to the rural communities of Sabah rather than distributing profit to its shareholders, leaders or members.

	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr6	Yr7	Yr8	Yr9	Yr10
OPERATING REVENUE											
Sponsored Support:-											
Government - Seed Fund	13,504	0	0	0	0	0	0	0	0	0	0
Yayasan Bayu - Principal of Endowment Fund	0	32,912	61,381	89,567	73,198	42,205	7,298	0	0	0	0
Total Sponsored Support	13,504	32,912	61,381	89,567	73,198	42,205	7,298	0	0	0	0
Investment Income:-											
Endowment Returns made available for Operations	0	12,395	41,764	70,824	99,728	131,595	167,474	174,617	175,740	175,749	177,050
Total Investment Income	0	12,395	41,764	70,824	99,728	131,595	167,474	174,617	175,740	175,749	177,050
TOTAL OPERATING REVENUE	13,504	45,307	103,145	160,391	172,927	173,800	174,772	174,617	175,740	175,749	177,050
OPERATING EXPENSES											
Rural Development :-											
Electrification	0	8,000	24,560	40,933	45,027	45,027	45,027	45,027	45,027	45,027	45,027
Road Accessibility	0	15,000	46,050	76,750	84,425	84,425	84,425	84,425	84,425	84,425	84,425
Grant to Centre of Excellence	0	5,000	5,000	5,000	3,000	3,000	3,000	2,000	2,000	1,000	1,000
Total Rural Development Expenses	0	28,000	75,610	122,683	132,452	132,452	132,452	131,452	131,452	130,452	130,452
Office Expenses											
Space and Occupancy	276	276	276	276	276	276	304	334	367	404	445
Salary and Benefits	6,000	6,480	6,998	7,558	8,163	8,816	9,521	10,283	11,106	11,994	12,954
General & Admin Expenses	6,000	3,000	3,070	3,142	3,215	3,290	3,367	3,445	3,526	3,608	3,692
Total Office Expenses	12,276	9,756	10,344	10,976	11,654	12,382	13,192	14,062	14,999	16,006	17,090
Other Expenses	1,228	7,551	17,191	26,732	28,821	28,967	29,129	29,103	29,290	29,292	29,508
Depreciation		120	120	120	120	120	0	0	0	0	0
TOTAL OPERATING EXPENSES	13,504	45,427	103,265	160,511	173,047	173,920	174,772	174,617	175,740	175,749	177,050
Profit/(Loss) Before Tax	0	-120	-120	-120	-120	-120	0	0	0	0	0
Tax	0	0	0	0	0	0	0	0	0	0	0
PROFIT/LOSS FOR THE YEAR	0	-120	-120	-120	-120	-120	0	0	0	0	0

Funding Through Yayasan Bayu

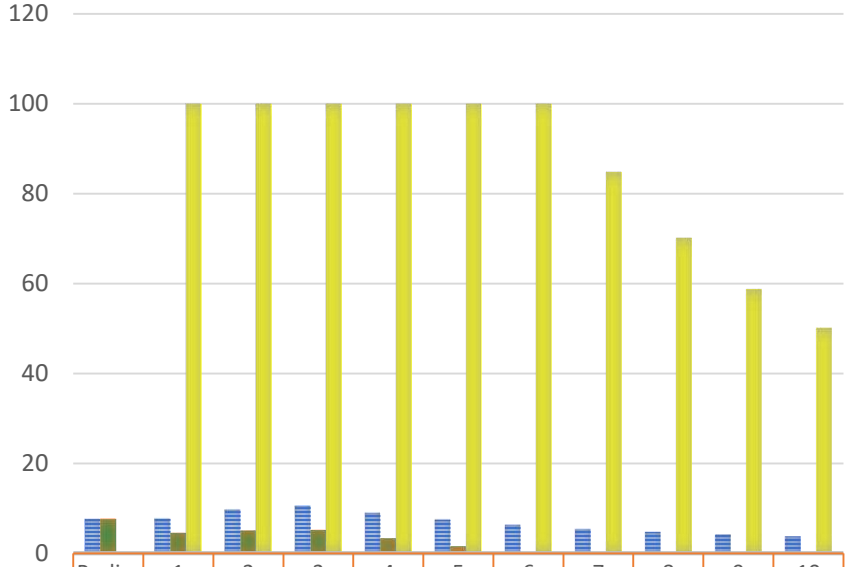
Government Grant

Single contribution of RM250m as seed fund

Endowment Fund

Rebate for Eco System Service (RESS)

1% from multiple selected industries impacting rural areas each year

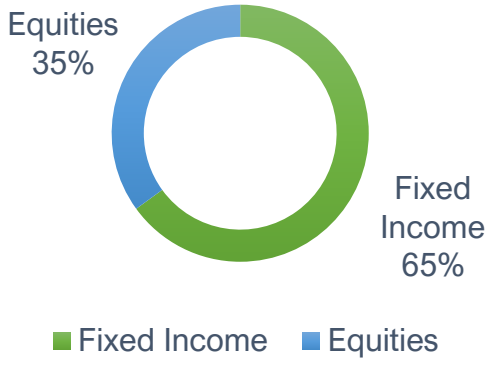


	Prelim	1	2	3	4	5	6	7	8	9	10
% Utilisation from Pooled funds	7.58	7.67	9.69	10.53	8.97	7.44	6.31	5.42	4.75	4.2	3.77
% Principal Withdrawal	7.58	4.53	5.01	5.2	3.3	1.53	0.22	0	0	0	0
% Returns Withdrawal	0	100	100	100	100	100	100	84.82	70.13	58.75	50.14

- From Prelim to Year 6, the investment returns are insufficient to cover the full cost of **SinaRaff's** operations, and so withdrawal from the principal amount is required to fund the balance.
- The principal withdrawal amount is relatively low, with the highest at 7.58% in the Prelim year. However, the prelim year is actually an exception considering that no investment will be made during the year, and so no investment return can be used.
- Once returns are generated, principal withdrawal decreases significantly, particularly from year 7 onwards.
- The total cost over 10 years is estimated at MYR 1.91 billion. However, on a year-to-year basis, the % of utilisation from the pooled funds are only approximately 10% of the total fund.

GIFT GLOBAL INSTITUTE FOR TOMORROW.

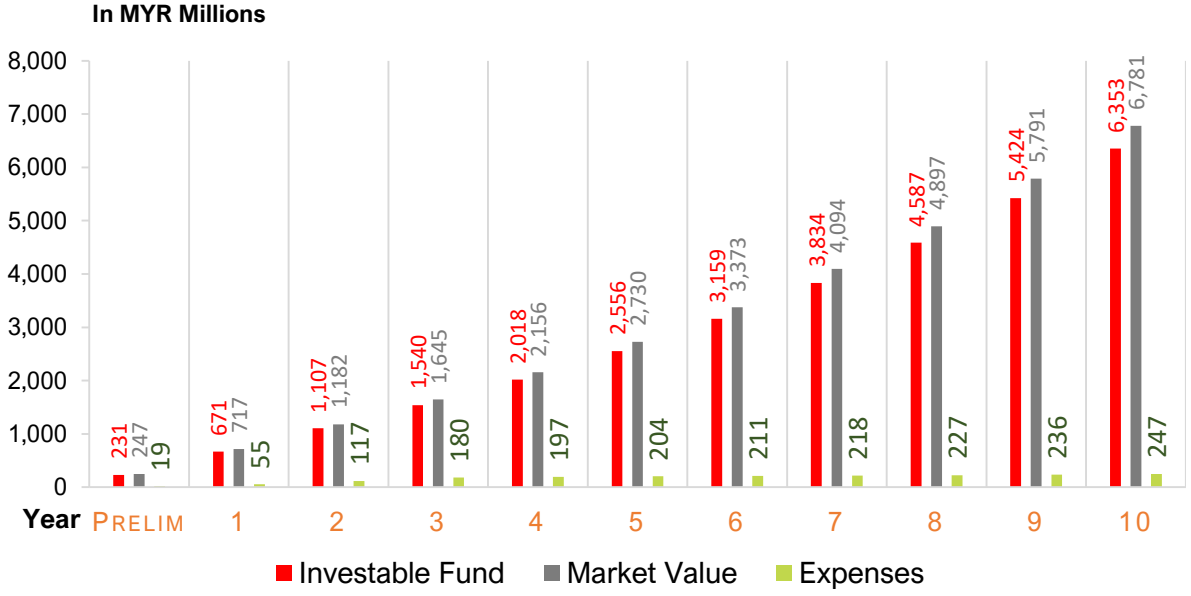
Market Value of Endowment Fund



- The Endowment Fund will adopt a low-risk investment approach, where the asset allocation mix will be 65% of fixed income and 35% in equities.
- The fixed income will be in the form of fixed deposits, corporate and Malaysian Government Security bonds, while the equity will concentrate on only domestic stock of a large, well-established and financially sound company that has a proven track record.

The total amount provided through seed funding and RESS at the end of year 10 amounts to MYR 6.58 billion, while the market value of the endowment fund sits at MYR 6.78 billion. This represents a gain of MYR 205 million while at the simultaneously successfully providing electrification, road access and education to 475 villages.

Financing of **SinaRaff's** opex is carefully managed through apportionment of the principal withdrawal and investment returns, ensuring that market value is preserved and the MYR 6.78 billion can be used to fund other government projects.



Projection 3: Yayasan Bayu

In MYR'000	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Opening balance at the beginning of period	-	246,756	716,638	1,182,148	1,645,473	2,155,669	2,729,746	3,373,366	4,093,932	4,896,863	5,790,556
Contributed Funds											
Sourced from:-											
Government grant - Seed Fund	250,000	-	-	-	-	-	-	-	-	-	-
RESS	-	480,000	508,800	539,328	571,688	605,989	642,348	680,889	721,743	765,047	810,950
Total Pooled Funds	250,000	726,756	1,225,438	1,721,476	2,217,161	2,761,658	3,372,095	4,054,255	4,815,675	5,661,910	6,601,506
Distribution & Allocation											
(a) SinaRaff's Budgeted Cost	13,504	45,307	103,145	160,391	172,927	173,800	174,772	174,617	175,740	175,749	177,050
Financed via:- Withdrawal from Seed Fund	13,504	-	-	-	-	-	-	-	-	-	-
Withdrawal from Y.Bayu Returns	-	12,395	41,764	70,824	99,728	131,595	167,474	174,617	175,740	175,749	177,050
Withdrawal from Y.Bayu Principal	-	32,912	61,381	89,567	73,198	42,205	7,298	-	-	-	-
(b) Yayasan Bayu's Budgeted Cost	2,939	3,144	3,363	3,600	3,855	4,129	4,425	4,743	5,086	5,456	5,854
Financed via:- Withdrawal from Seed Fund	2,939	-	-	-	-	-	-	-	-	-	-
Withdrawal from Y.Bayu Returns	-	3,144	3,363	3,600	3,855	4,129	4,425	4,743	5,086	5,456	5,854
(c) Allocation for Fund Management Expenses	2,500	7,268	12,254	17,215	22,172	27,617	33,721	40,543	48,157	56,619	66,015
Total	18,943	55,718	118,763	181,206	198,953	205,546	212,918	219,903	228,983	237,824	248,919
Utilization of Pooled Funds	7.58%	7.67%	9.69%	10.53%	8.97%	7.44%	6.31%	5.42%	4.75%	4.20%	3.77%
% of Principal Withdrawal	7.58%	4.53%	5.01%	5.20%	3.30%	1.53%	0.22%	0.00%	0.00%	0.00%	0.00%
% of Returns Withdrawal	-	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	84.42%	70.13%	58.75%	50.14%
Investable Funds	231,057	671,038	1,106,675	1,540,270	2,018,208	2,556,112	3,159,177	3,834,352	4,586,692	5,424,086	6,352,587
Investment											
(d) Returns from Fixed Income	8,260	23,990	39,564	55,065	72,151	91,381	112,941	137,078	163,974	193,911	227,105
Fixed Income - Opening Balance	150,187	436,175	719,339	1,001,176	1,311,835	1,661,473	2,053,465	2,492,329	2,981,350	3,525,656	4,129,182
Fixed Income with Returns	158,447	460,164	758,903	1,056,240	1,383,986	1,752,854	2,166,406	2,629,407	3,145,324	3,719,567	4,356,287
(e) Returns from Equity	7,278	21,138	34,860	48,519	63,574	80,518	99,514	120,782	144,481	170,859	200,107
Equity - Opening Balance	80,870	234,863	387,336	539,095	706,373	894,639	1,105,712	1,342,023	1,605,342	1,898,430	2,223,406
Equity with Returns	88,148	256,001	422,197	587,613	769,946	975,157	1,205,226	1,462,805	1,749,823	2,069,289	2,423,512
Total Funds with Returns	246,596	716,165	1,181,099	1,643,854	2,153,932	2,728,010	3,371,632	4,092,212	4,895,147	5,788,856	6,779,799
Average % of Returns	6.725%	6.725%	6.725%	6.725%	6.725%	6.725%	6.725%	6.725%	6.725%	6.725%	6.725%
Total Returns from Investment [(d) + (e)]	15,539	45,127	74,424	103,583	135,724	171,899	212,455	257,860	308,455	364,770	427,211
Fund Management Expenses	1.01%	1.01%	1.01%	1.01%	1.01%	1.01%	1.01%	1.01%	1.01%	1.01%	1.01%
(f) Actual	2,339	6,794	11,205	15,595	20,434	25,881	31,987	38,823	46,440	54,919	64,320
Fixed Income	1,126	3,271	5,395	7,509	9,839	12,461	15,401	18,692	22,360	26,442	30,969
Equity	1,213	3,523	5,810	8,086	10,596	13,420	16,586	20,130	24,080	28,476	33,351
(g) Balance from Allocation [(c) - (f)]	161	473	1,049	1,620	1,737	1,736	1,734	1,720	1,716	1,700	1,695
Closing balance at the end of the period	246,756	716,638	1,182,148	1,645,473	2,155,669	2,729,746	3,373,366	4,093,932	4,896,863	5,790,556	6,781,494

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Enabling Policies

Proposed Enabling Policies (1)

In order to ensure the greater success of the model, policy changes can be enacted to support **SinaRaff**, the Endowment Fund and the community. Broadly, these policies will have the following objectives:

- To establish **SinaRaff** as a leading Government Linked Company from the offset
- To support the raising of funds for the CAPEX and OPEX of (Endowment and RESS)
- To accelerate links between current government initiatives to electrify rural communities with the electrification operations of the GLC
- To support the growth of Community Based Organisations through incentivised uptake and ownership of renewable energy systems
- To encourage strategic partners to get involved with the Centre of Excellence

SinaRaff

- To establish **SinaRaff** as a Government Linked Company with the approval of the State Government Cabinet
- To reduce or waive **SinaRaff's** tax amount in its first operational years due to its status as non-profit Government Linked Company
- To expedite visa processing for international experts (like MSC status companies in Malaysia)

Endowment Fund

- To allow existing government organisations (such as MESTECC & SEDA) and other initiatives around rural development to contribute towards the formation of the Endowment Fund

Enabling government policies are mandatory for the set up of SinaRaff, and vital for meeting its mandate in the long-term

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Proposed Enabling Policies (2)

COE

- To allow private companies, academic institutions, or NGOs that supply teachers or academic resources to the Centre of Excellence to have an allocation for education allowance that is tax deductible

RESS

- To introduce a new RESS policy that places a 1% levy on extractive industries operating in rural Sabah
- To pass legislation that enables the Endowment Fund as the recipient of the RESS tax

CBO

- To expedite the process of obtaining licenses for Community Based Organisations to set and collect tariffs as per the 1990 Electricity Act
- To allow tax reductions or waivers for revenue generated by the Community Based Organisations on collected tariffs

Social Impacts & Community Benefits

Benefits of Electrification and Accessibility

PRODUCTIVITY

- Small changes from regular electricity supply can translate into meaningful impacts, such as the introduction of lightbulbs to extend working hours to increase productivity.
- Small businesses can effectively upscale through the use of electric tools such as grinders, drills, and milling machines, that all catalyse manual working processes.

KNOWLEDGE

- Rural students benefit from educational tools and increased access to contemporary information and resources the use of television, radio, and the internet.
- Increased transfer of knowledge and skills to the community.

SOCIAL COHESION

- Night-time lighting enables people to enjoy evening events, or to conduct meetings.
- Inter-village roads and lighting to allow frequent and safe visits between villages.
- Positive community changes will help combat rural-urban migration and contribute to population retention of youth and skilled individuals.

HEALTHCARE

- Discontinuation of indoor fossil-fueled lighting sources, such as kerosene lamps, will reduce respiratory illness rates.
- Lights and roads will be essential during childbirth or medical emergency.
- Improvements in basic healthcare will improve quality of life significantly.

EMPLOYMENT

- **SinaRaff** will require strong community participation to reach its objectives, resulting in many employment opportunities for road construction, mini-grid maintenance, and education provision.
- Improved business activity will encourage small local businesses to expand and hire more staff.

BUSINESS OPPORTUNITY

- Greater business opportunities will arise from increased interaction, trade, and knowledge-transfer between villages and urban areas.
- Accessibility will enable the shift from subsistence agriculture to profit.
- In addition to catalysing current work processes, electrification will introduce entirely new business opportunities, such as ice-making machines and fridges.

QUALITY OF LIFE

- Communities will have better rural-urban integration through access to goods and services that can lead to improved quality of life.
- Shorter commute times between villages and urban areas will allow communities to have more available time for leisure or work.
- Basic electric goods such as fans and fridges will improve standards of living.

Electrification and accessibility were selected as key focus areas for rural development due to the host of benefits they impart

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Monitoring Social Impact

In order to determine the tangible benefits that **SinaRaff** delivers to Sabahan rural communities, impact evaluation must take place. Considering that **SinaRaff** is a GLC, it is essential that these benefits can be logged to improve **SinaRaff's** effectiveness and provide a transparent narrative to all stakeholders. To achieve extensive social impacts, certain targets have to be met:

200 villages to be electrified

6,500 Households to get access to renewable energy

1,500 jobs created in 5 years

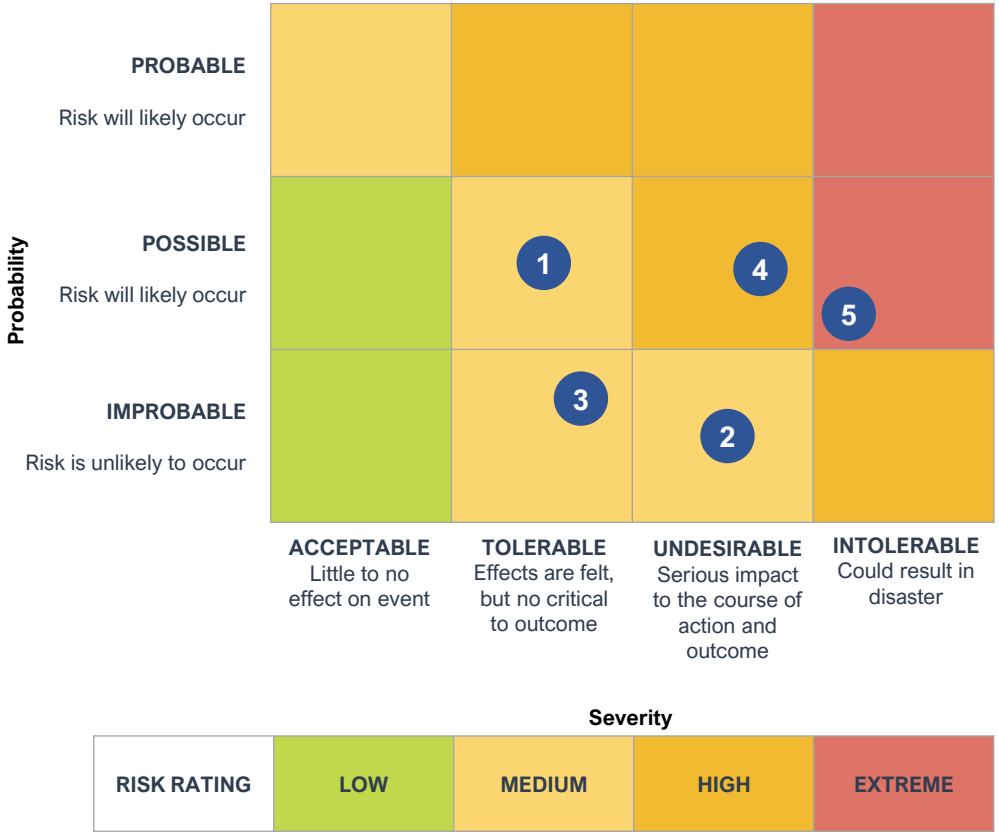
Along the way, detailed indicators will be evaluated with a variety of methodologies and partners to give a granular depiction of social impact:

Potential Indicators	Methodology	Potential Partners
• Increase of income levels	• Independent studies	• Government
• Number of households electrified	• Census reports	• Non-Governmental Organisations
• Number of villagers impacted	• Interviews	• Academic Institutions
• Number of jobs created	• Focus groups	• Field Audit Firms
• Reduction in carbon emissions	• Random checks	• Partner SMEs in-field

Risk Analysis & Mitigation

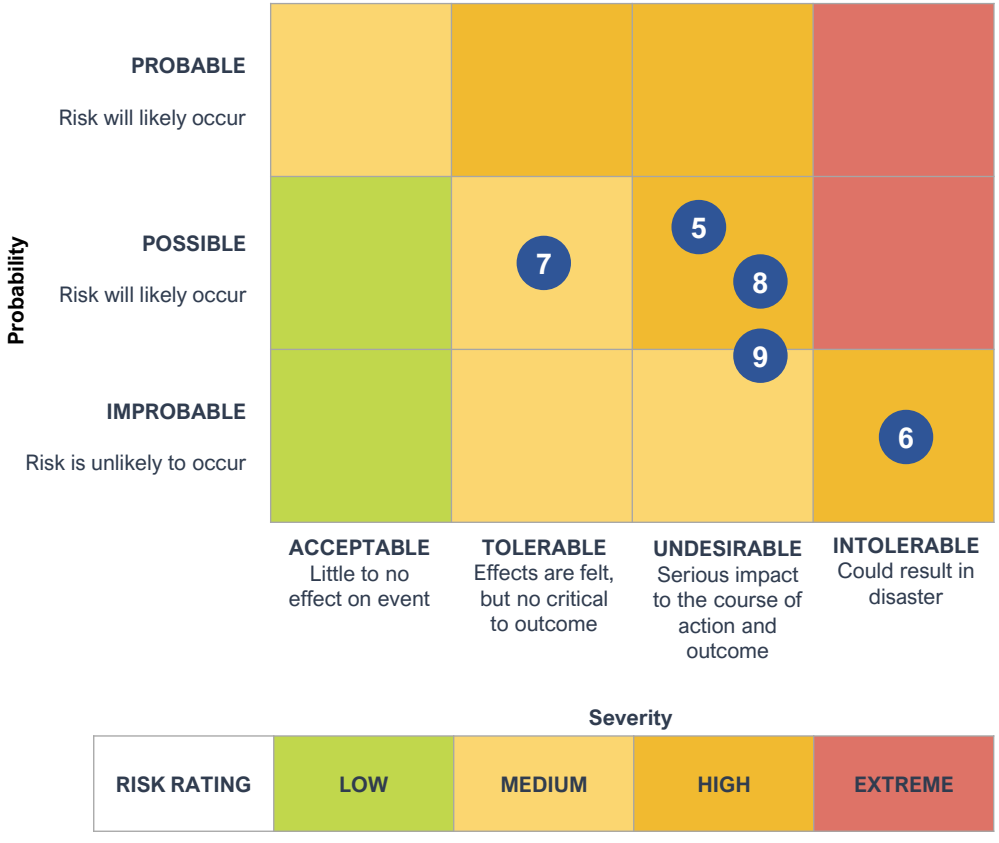
Risk Analysis & Mitigation 1/2

	Risk	Mitigation	
Political	Challenges arising from change in government	Enacting legislations to insulate from government changes	1
	Regulatory changes, particularly around Environment and Renewable Energy	Maintaining a strong relationship with government and relevant bodies	2
Financial	Default risk of losses from non-repayment of principal investment	The risk is reduced by investing in high quality securities as these have a lower degree of credit risk	3
	Endowment contributions do not reach the projected targets	Initial seed funding from government large enough to cover running costs and required investment	4
	RESS levy is not implemented or managed correctly post-setup	Lobby and maintain strong relationships with the government body handling RESS	5



Risk Analysis & Mitigation 2/2

	Risk	Mitigation	
Implementation	Compliance risk from SME network and CBO's on system implementation, operations & management	Regular supervision and monitoring from **SinaRaff** and PRE's technical team	5
	Technical malfunctions, defects, and failures of the mini-grid system	Use of standardised components that adhere to quality standards, hiring contractors with strong track record	6
	Risk of unpredictable electricity demand	Size systems to account for marginal growth in demand, use of prepaid meters and energy efficient products	7
	Miscommunications between businesses and customers, and shortage of managerial personnel in rural areas	Standardization: appropriate accounting, regular auditing, training personnel	8
	Compliance risk from key stakeholders and strategic partners	Strong governance structure and policies	9



Implementation Plan

Implementation Timeline : Pre-Op Year

Focus Area	Phases	Year 0			
		Q1	Q2	Q3	Q4
Policy & Funding	Enact policies				
	Secure investment from government				
	Set up Yayasan Bayu				
Governance & Organisational Structure	Establish **SinaRaff** as a GLC entity				
	Establish **SinaRaff** Board of Directors & Yayasan Bayu Board of Trustee				
	Hire **SinaRaff** Management Team				
	Hire Yayasan Bayu's Chief Investment Officer				
	Establish Yayasan Bayu's Investment Committee				
	Hire **SinaRaff** employees				
Operations and Strategic Partnerships	Alliance with government, NGOs etc. for policy support and advocacy				
	Identify Productive End Users				
	Develop strategic partnerships for energy and accessibility projects				
	Review curriculum with Centre of Excellence's partner for skills development				

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Implementation Timeline: 5 Year Plan

Focus Area	Phases	Year 1				Year 2				Year 3				Year 4				Year 5			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Funding	Sourcing funding from RESS levy																				
	Returns from Endowment Fund																				
Operations and Strategic Partnerships	Setup COE for community clusters																				
	Installing energy systems and constructing roads																				
	CBOs maintaining and operating energy and road systems																				
	Independent Auditing process																				

Conclusion

Critical Success Factors

Electricity and accessibility are essential basic human needs and key to socio-economic development. They serve as a catalyst to help in reducing poverty levels.

This proposal intends to elevate the development level of rural communities. There exist many government initiatives to tackle rural underdevelopment in Sabah. However, due to the isolation of these communities these efforts have not reached their potential.

The project team has identified these gaps and proposed solutions to address them in this business plan. The model requires the marrying top-down approaches from the government with bottom-up approaches from local NGOs and SMEs. Thus, the proposal suggests the creation of a Government Linked Company, called **SinaRaff**.

The newly established **SinaRaff** will support rural communities' development in multiple areas, covering electricity, accessibility, education and health. It will achieve this through construction of renewable energy systems; an improved road network; better access to education through the Centre of Excellence; contemporary healthcare facilities and services. **SinaRaff** will build an ecosystem of SMEs to implement its mandate by leveraging on their local knowledge and expertise and ensuring community involvement by upskilling and employing locals. The emphasis on community involvement is integral for the long-term success of the model.

Seed funding from the government will provide the capital required to set up **SinaRaff**. A considerable one-off grant will also kickstart an Endowment Fund that will generate revenue through interests paid on secure investments in order to cover the operational costs. Additionally, the RESS scheme will contribute toward maintaining operations by imposing a 1% levy on local extractive industries that will add to the Endowment Fund, ensuring the self sustenance of **SinaRaff**.

Critical drivers for success:

- The success of this proposal relies on the support and foresight of the Sabah Government, including - but not limited to - the Chief Minister's office and cabinet, key ministries such as Ministry of Rural Development and SESB.
- Further due diligence, including completion of the Masterplan for Rural Electrification and Development for Sabah.
- Passing legislation at federal and state levels for several reasons: to establish the new GLC; to capitalise the model with an initial grant to set up the endowment fund; to mobilise RESS; to be able to charge key anchor tenants an energy tariff, all in order to have a consistent revenue stream to support the operations of **SinaRaff**.
- A robust governance mechanism for both **SinaRaff** and Yayasan Bayu that guarantees efficiency and transparency
- The identification and cultivation of a pipeline of productive end users for revenue generation at the mini-grid level.
- Strong ties with civil society partners who are experienced and trusted in rural communities.
- Transfer of knowledge and skills to the community to foster a sense of ownership and for long-term sustainability of the model.
- An equal focus on the social and financial mandate of **SinaRaff** to promote sustainable development for all.

GIFT GLOBAL INSTITUTE FOR TOMORROW.

Thank you

For more information about the 2019 Malaysian Young Leaders Programme, or Tonibung & PRE, please contact enquiry@global-inst.com

GIFT GLOBAL INSTITUTE FOR TOMORROW.