# Business Models for Decentralised Rural Electrification / tariff setting

**18 May 2016**

**Netherlands**

**Development**

**Organisation**

SNV

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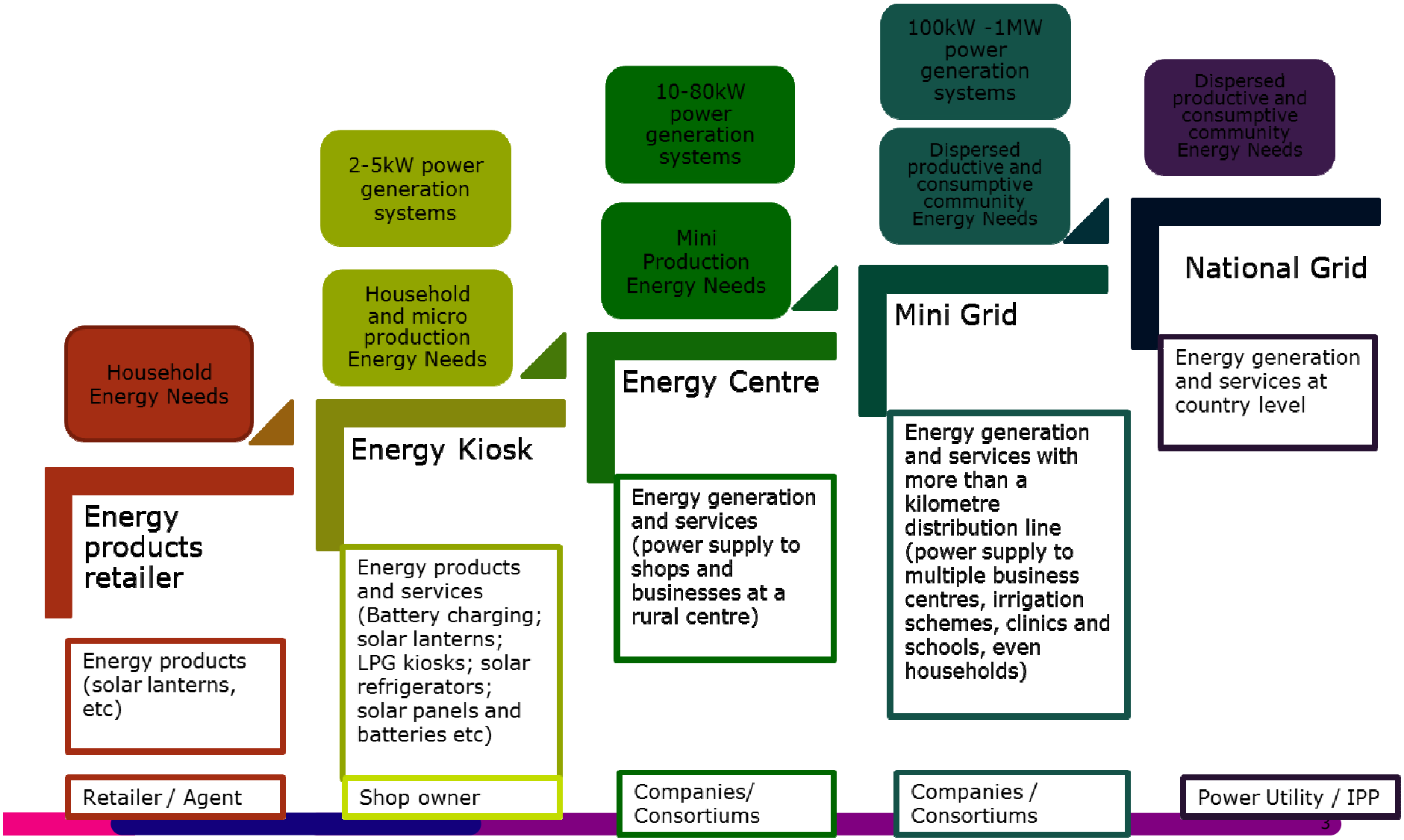
# Business Models Developed for upscaling mini grids

- Relevant to community needs
- Private sector identification and presentation of business cases for investment
- Private investors include both local business people (rural shop owners) and more established bigger businesses
- Business models make business sense!
- Energy ladder vs mini grids models and subsequently investment levels and investors

# Business Models Basis

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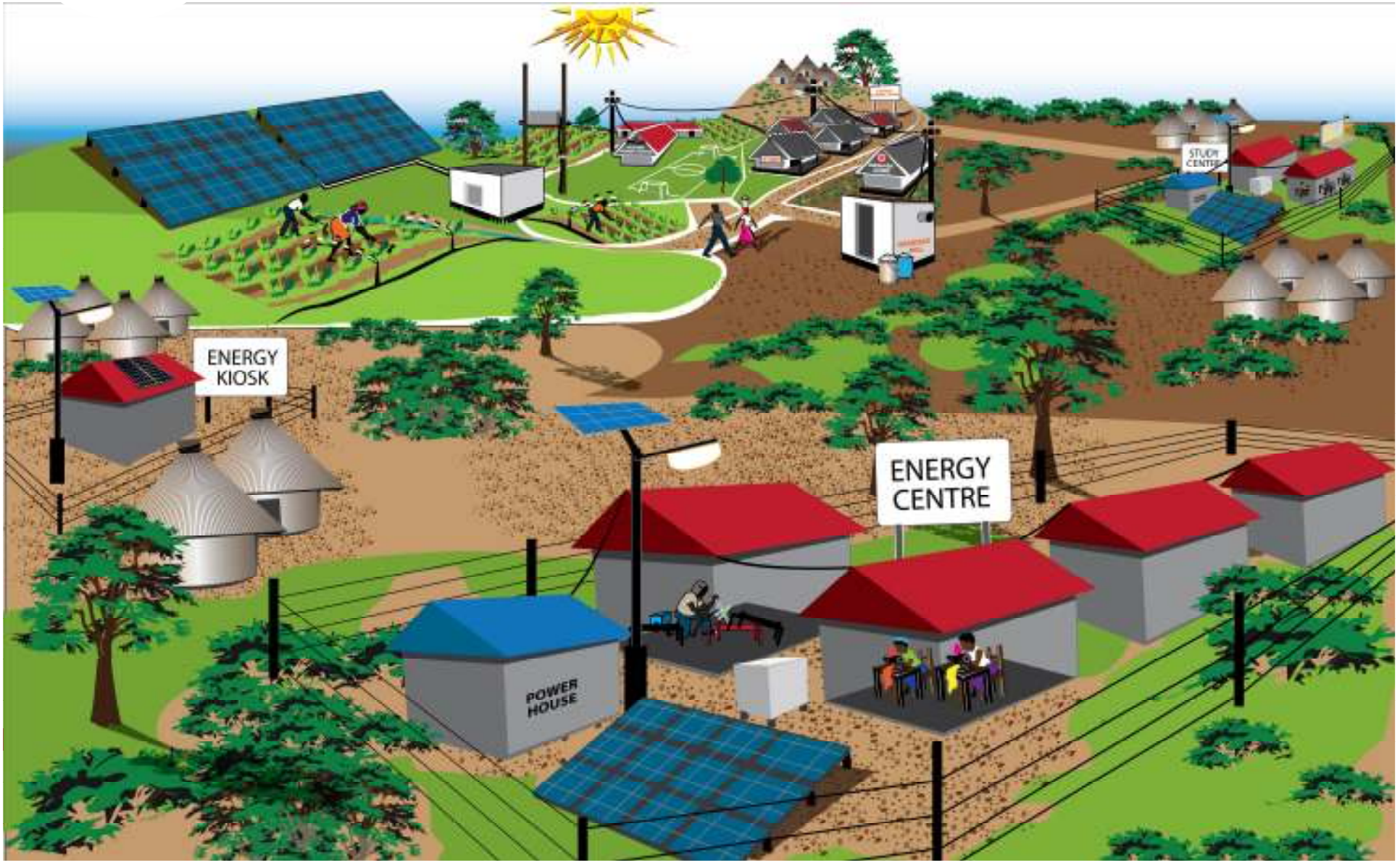
# Sustainable Energy for Rural Communities (SE4RC) Project Business Models at a Glance



# Business Model 1: Energy Kiosks (2.2 – 5kW)

- SE4RC Project to establish at least 10 energy kiosks in Gwanda; five off grid and five on-grid – 5 already established
- Retailing of clean energy products (solar lanterns, solar refrigerators, solar panels, battery charging facilities, LPG retailing, solar pumps)
- Owned by local rural retailers and run as businesses (EKEs)
- Providing energy for household lighting, entertainment, water pumping for community gardens and livestock, cooking and communication
- EKEs linked to solar wholesale companies in Harare and Bulawayo (Total Zimbabwe, Sungevity, Samansco, GasLogik)
- New business venture – risk sharing in capital investment structure (Equity, grant, loan)
- Special attention to youths and women – economic empowerment for women using SNV's Health and Wealth Gender Approach
- Loan repayments based on most fast moving product

# Energy Kiosks – On and off grid

- Type of investor – rural shop owner
- Designed to be demonstration centres that provide solar and clean energy services and products
- Some employ agents (youths and women at women's groups) to sell solar products for a commission
- Others market products on their own
- Financing mechanism (grant (50%):loan (50%) :equity (US$1000 for men and US$500 for women and youths) – grant / loan for working capital; equity for establishment fees.


From incubation (movable container) to established shop - EKEs use own existing shops as energy kiosks



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# Energy Kiosks – On and off grid

## On-Grid Energy Kiosks

- On-grid EKEs get their energy from mini grid or energy centres and pay business tariffs on a prepayment basis

## Off-Grid Energy Kiosks

- Off-grid EKEs generate their energy from solar panels on the roof of the kiosks

**Products sold**

- Solar lanterns (plug and go systems are popular); Solar fans; Solar batteries; Solar panels; Solar refrigerators; DC irons; DC TVs
- Solar powered water pumping systems

**Services offered**

- Battery charging
- LPG refilling
- Entertainment – TV screens for live cable football matches
- Internet and wifi hotspots (coming soon)

## Incubation Energy Kiosks

- Container kiosks
- Suitable for new business owners, usually women and youths with no established shops.
- Kiosk owners operate from moveable containers while assessing products demand and building permanent shops.
- After 6 months to a year, container kiosk moves to another EKE.
- Kiosks will be property of Gwanda RDC and will be used to provide services to more EKEs to cover more communities (replication model). RDC trained to size and site EKEs.
- Financing mechanism – Container for six month to a year (grant); working capital (grant (50%):loan (50%) :equity (US$1000 for men and US$500 for women and youths – equity includes establishment fees.

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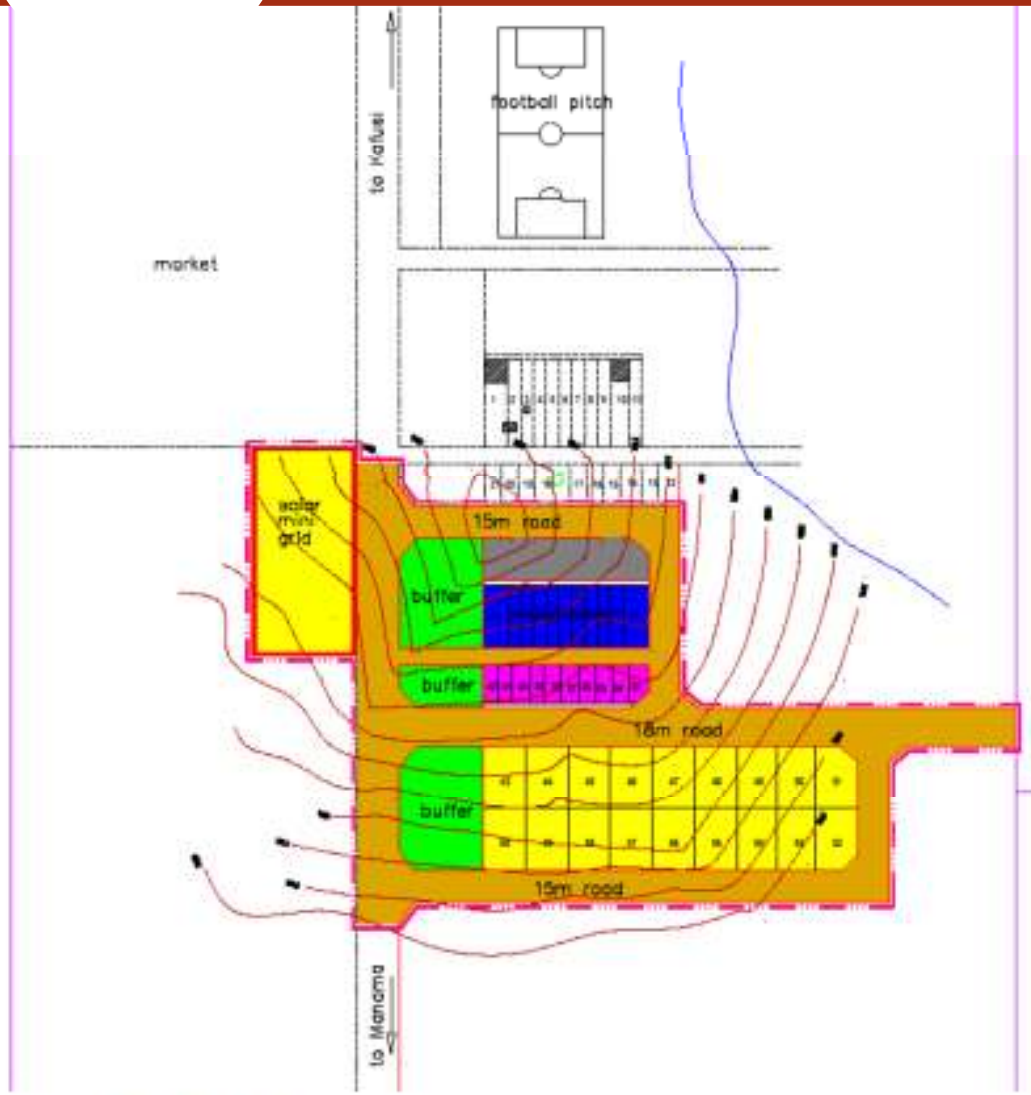
# Business Model 2: Energy Centres (30 – 40kW)

- For business or economic centres / nodes
- On site generation of power for economic activities
- Pulling home industry activities to a local centre – easier and more cost effective to electrify
- Minimises costs of transmission and distribution
- Generates enough power for economic and business activities
- Appropriate for communities with a lot of energy demanding activities which are located in homes
- SE4RC Project to establish 2 energy centres in two villages at Takaliyawa and Borabora business centres

# Takaliyawa Energy Centre (40kW)





- Monthly market activities targeted to generate energy needs (abattoir, coldroom / refrigeration facilities, grain mealie packaging; water bottling, mobile phone battery charging facilities, in the long run short term lodging for vendors)
- Two types of energy customers – monthly and daily
- Monthly – associated with market day
- Daily – normal rural business centre businesses
- Offtakers (fodder producers, livestock fattening pens, water bottling)
- Stand alone solar lighting systems for football pitch – social gatherings and youths entertainment activities.
- Business tariff for businesses and offtakers
- Prepaid metering revenue collection system

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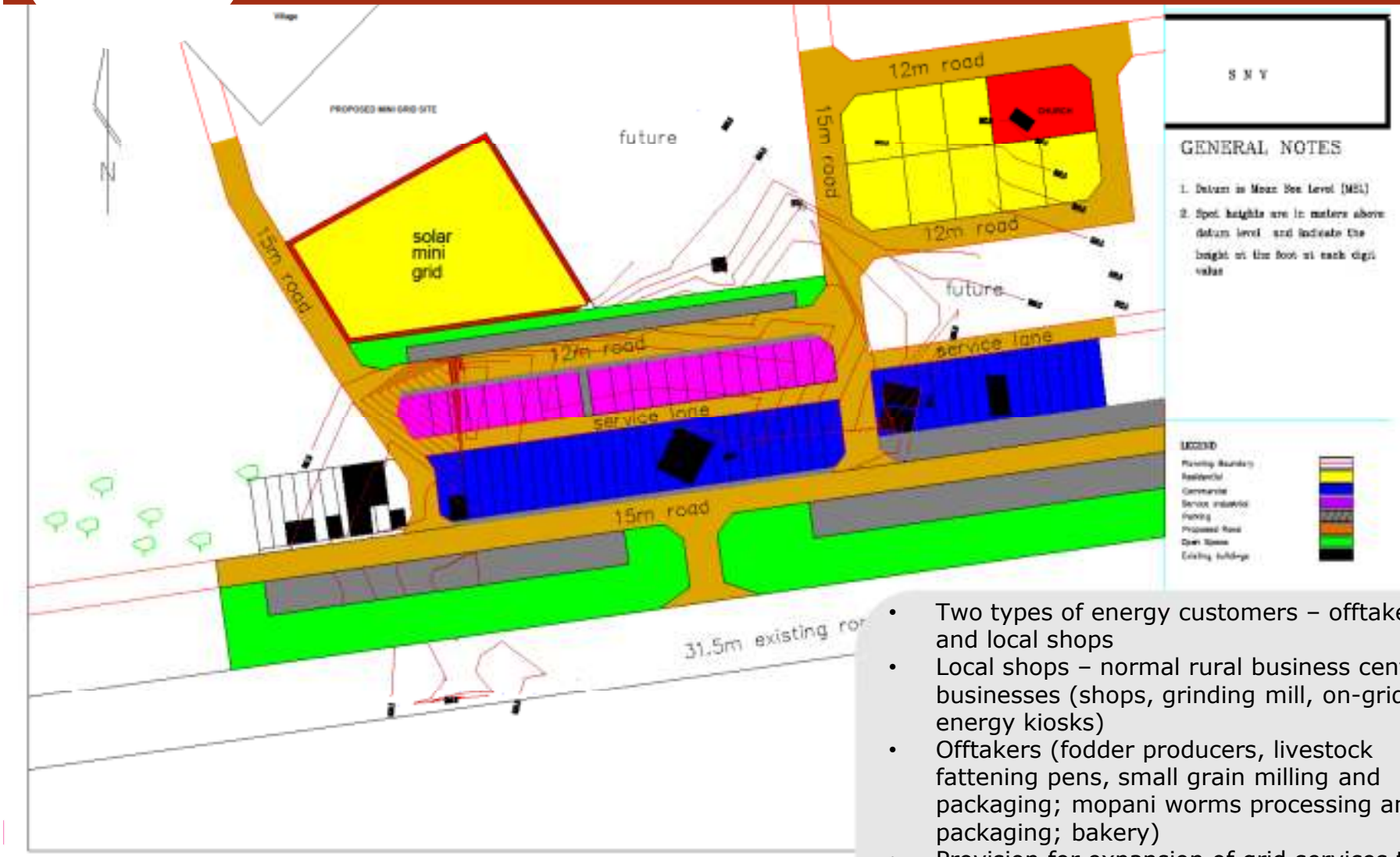
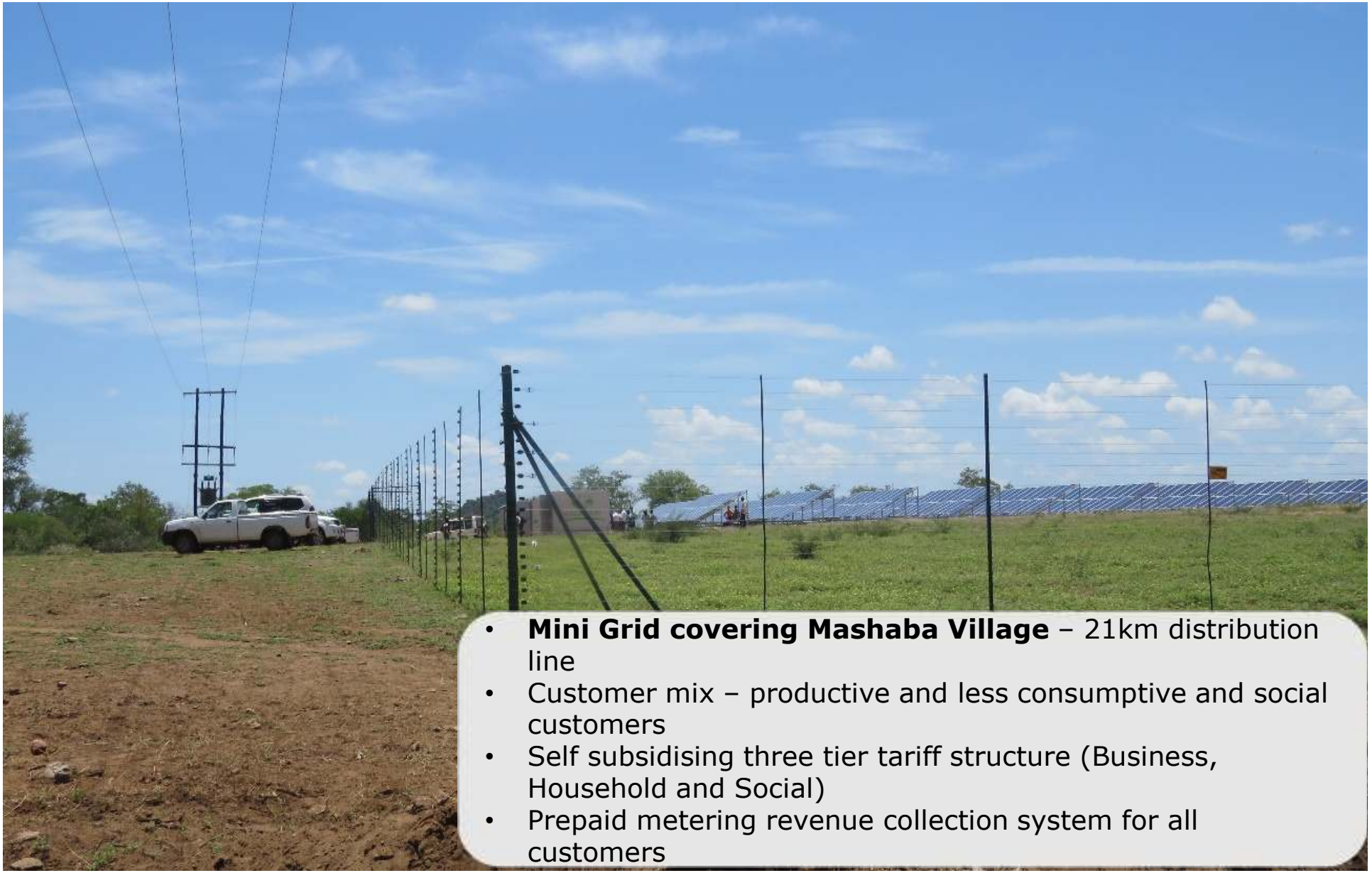
# Borabora Energy Centre (30kW)



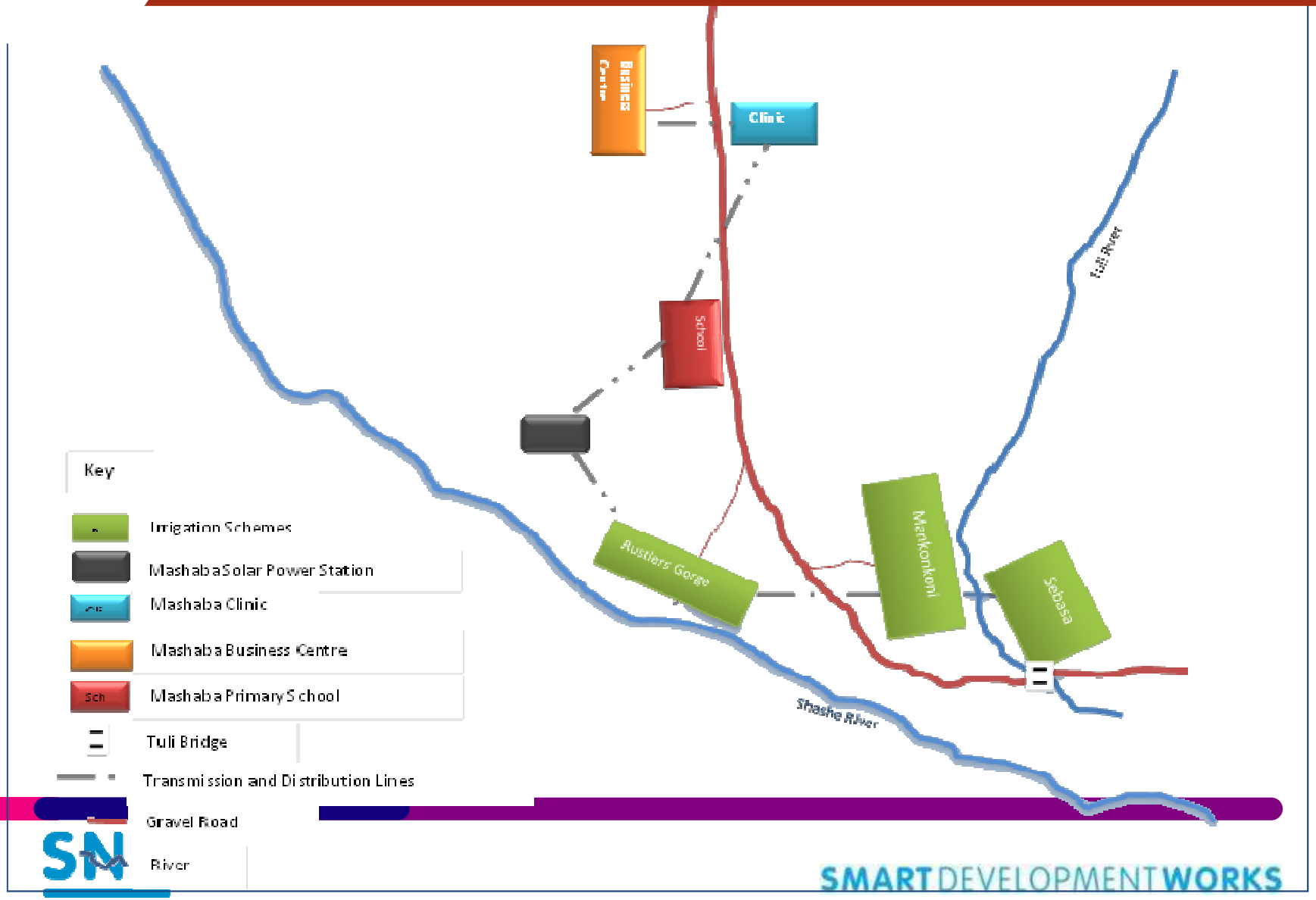

- Two types of energy customers – offtakers and local shops
- Local shops – normal rural business centre businesses (shops, grinding mill, on-grid energy kiosks)
- Offtakers (fodder producers, livestock fattening pens, small grain milling and packaging; mopani worms processing and packaging; bakery)
- Provision for expansion of grid services to nearby village to the north.
- Business tariff for businesses and offtakers
- Prepaid metering revenue collection system

# Business Model 3 : Mini Grid (99kW)



- **Mini Grid covering Mashaba Village** – 21km distribution line
- Customer mix – productive and less consumptive and social customers
- Self subsidising three tier tariff structure (Business, Household and Social)
- Prepaid metering revenue collection system for all customers

# Mashaba Solar Mini Grid – Load Centres

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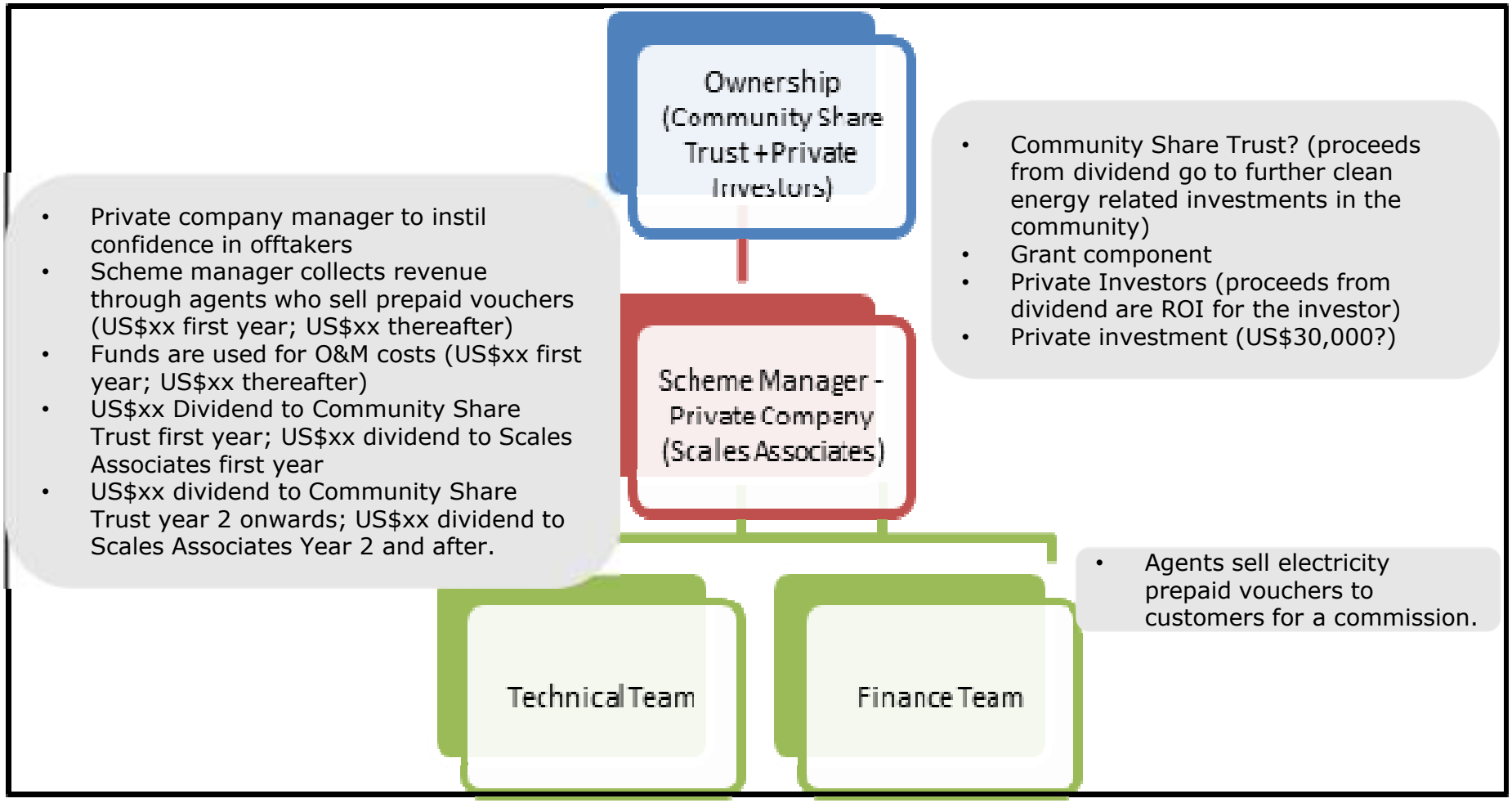
# Ownership and Management Model for Energy Centres and Mini Grids




- Private company manager to instil confidence in offtakers
- Scheme manager collects revenue through agents who sell prepaid vouchers (US$xx first year; US$xx thereafter)
- Funds are used for O&M costs (US$xx first year; US$xx thereafter)
- US$xx Dividend to Community Share Trust first year; US$xx dividend to Scales Associates first year
- US$xx dividend to Community Share Trust year 2 onwards; US$xx dividend to Scales Associates Year 2 and after.

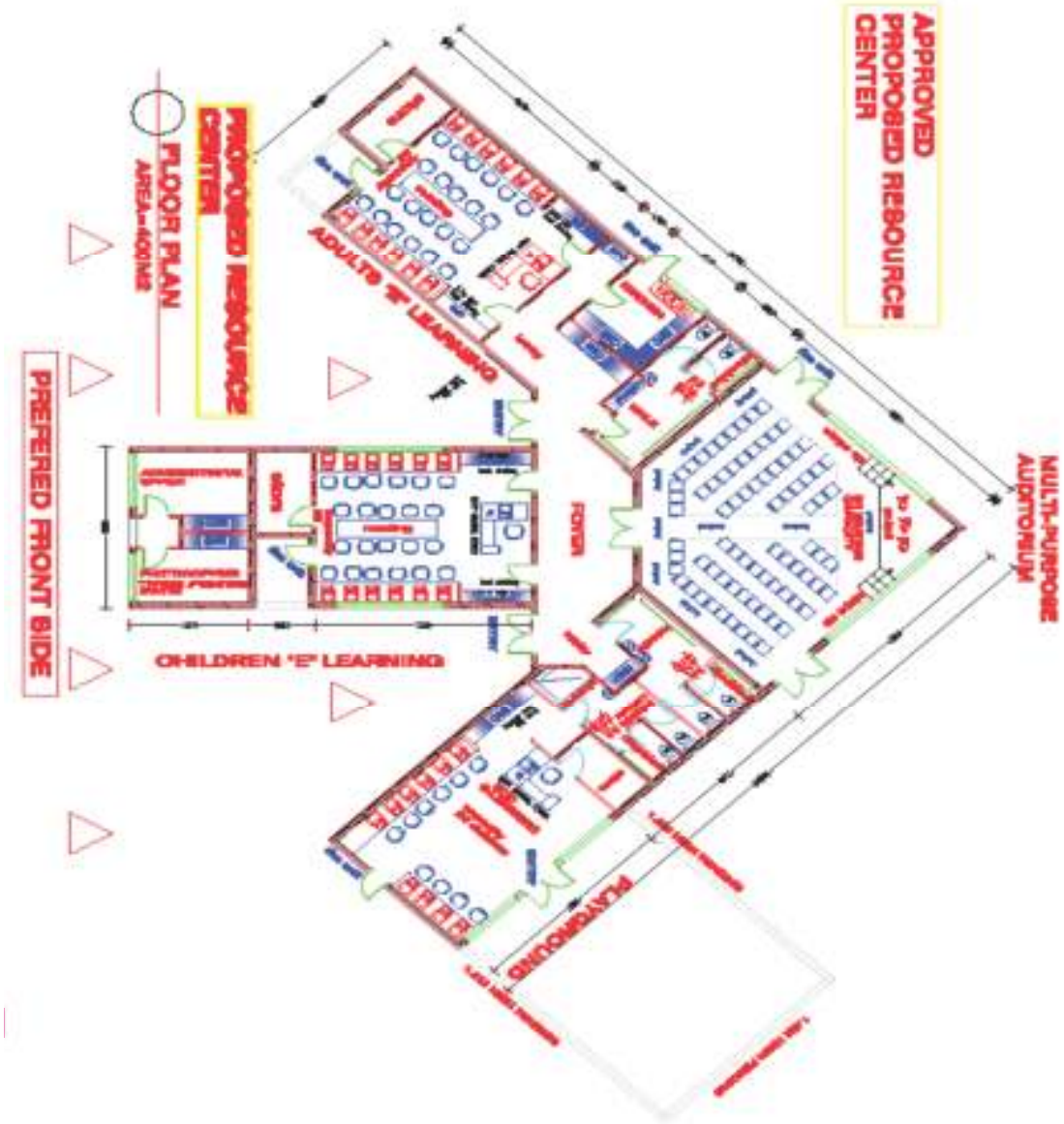
- Community Share Trust? (proceeds from dividend go to further clean energy related investments in the community)
- Grant component
- Private Investors (proceeds from dividend are ROI for the investor)
- Private investment (US$30,000?)

- Agents sell electricity prepaid vouchers to customers for a commission.

# Business Model 4: Study Centre (30kW)

- For supplementary education services for rural students and adult education, including vocational and skills training including e-tutorials, e-revisions and additional reading material. Will make use of e-courses and e-learning materials.
- It will provide wifi and internet facilities
- Targets communities with no energy for education services which disadvantages children from rural communities
- Project to establish 1 study centre in Mlambapele Village
- Will provide energy for e-learning for pre-school, primary, secondary and vocational level children
- Will provide energy for youths entertainment and youth support services (e-information and e-counselling on reproductive health, life skills training, recreation, HIV information, career opportunities, health education talks.
- Will provide energy for practical and technical subjects such as fashion and fabrics, cookery, carpentry and welding for secondary school children
- Will be owned and run as a going concern enterprise with a viable tariff (TBD)

# Study Centre Design




- Preliminary work being done in 2016 – designs, looking for funders of the construction of the centre, etc.
- Stand alone system with its own solar park.
- Fee paying services will be incorporated to ensure viability of the Centre (photo copying, internet facilities, etc)
- Layout plan submitted for approval by Department of Physical Planning in Gwanda. Structure design (left) submitted for approval by RDC
- Phased approach to be employed.
- Street lighting for security of girls and kids will be established.
- Ownership model TBD but likely to be community with private management.
- Token fee paying for viability by users.

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# Tariff Setting

- A tariff that balances viability and affordability
- Identify value chain businesses that will enhance economic development of target areas and increase customer base.
- A self-subsidising tariff structure designed for every individual scheme, social services are also able to access clean energy viably in the solar mini grid programmes. In all tariff structures, affordability is ensured and balanced with viability of each solar mini grid.

# Basic definitions necessary in tariff setting

- **Viability** – ensure smooth day to day running of Energy Enterprises (meet day to day running costs)
- **Sustainability** – ensure that energy enterprise outreach grows beyond customer reach of initial investment. Also ensures that energy enterprise has sufficient proceeds to generate replacement value after lifespan
- **Replicability** - models that can be up-scaled in other areas with similar energy need characteristics, or adapted to suite other energy poor communities.

# Principles in tariff setting

**Energy Based Tariffs – End user Tariff**

- Consultative and reflective of affordability – repayment based on most recurring assets
- Profit based vs Break even tariffs
- Costing – operational costs, replacement value costs
- Self subsidizing tariff structure reflecting customers price elasticity
- Revenue collection method - Prepaid metering
- Viability tariff – covers operational costs
- Sustainability tariff – covers replacement costs and operational costs

**Power based tariff - Operator**

- Wholesale tariff
- Charged by a generator to a bulk purchaser who in turn sells to end users
- Negotiated tariff based on production levels and expected power consumption by end users
- Risk with bulk purchaser
- Profit based
- Costing – usually covers bulk purchaser's operational costs; generator's cost may include generation costs and replacement value costs
- Revenue collection method – Bulk metering and either post or prepaid metering

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# Principles in tariff setting

## Fee for service tariff – Management Fee

- Charged by a manager of a system and constitutes operational costs of the system
- Adds to end user tariff
- Negotiated tariff based on expected performance deliverables of the manager by the contractor
- Profit based on the part of the managing company
- Manager is paid at agreed intervals – in arrears

# Opportunities for Private Players

- Ownership of energy kiosks /energy centres
- Ownership of energy generation systems of energy centres
- Suppliers and installers of renewable energy components and systems – market is already developing
- Suppliers of other materials (cement for construction; etc)
- End use customers of energy generated
- Managers of decentralised mini grids
- Offtakers

# SE4RC Partners

## Implementing Partners

## Funding Partners



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