



LET THERE BE
LIGHT
PHOTON FUND, NEPAL

Morgan Stanley Sustainable Investing Challenge
April 04, 2014

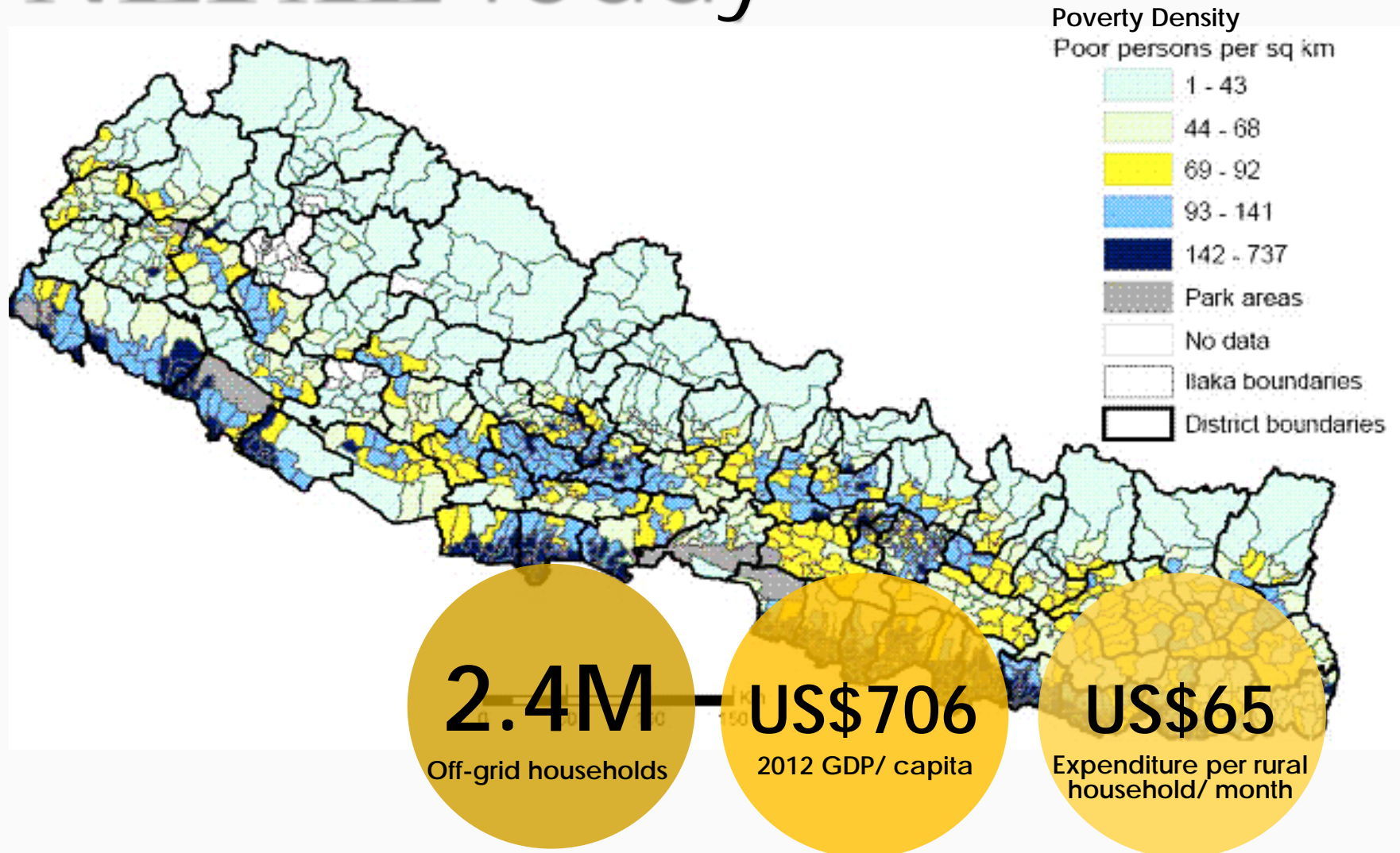


night-light

noun \ 'nɪt-lɪt \

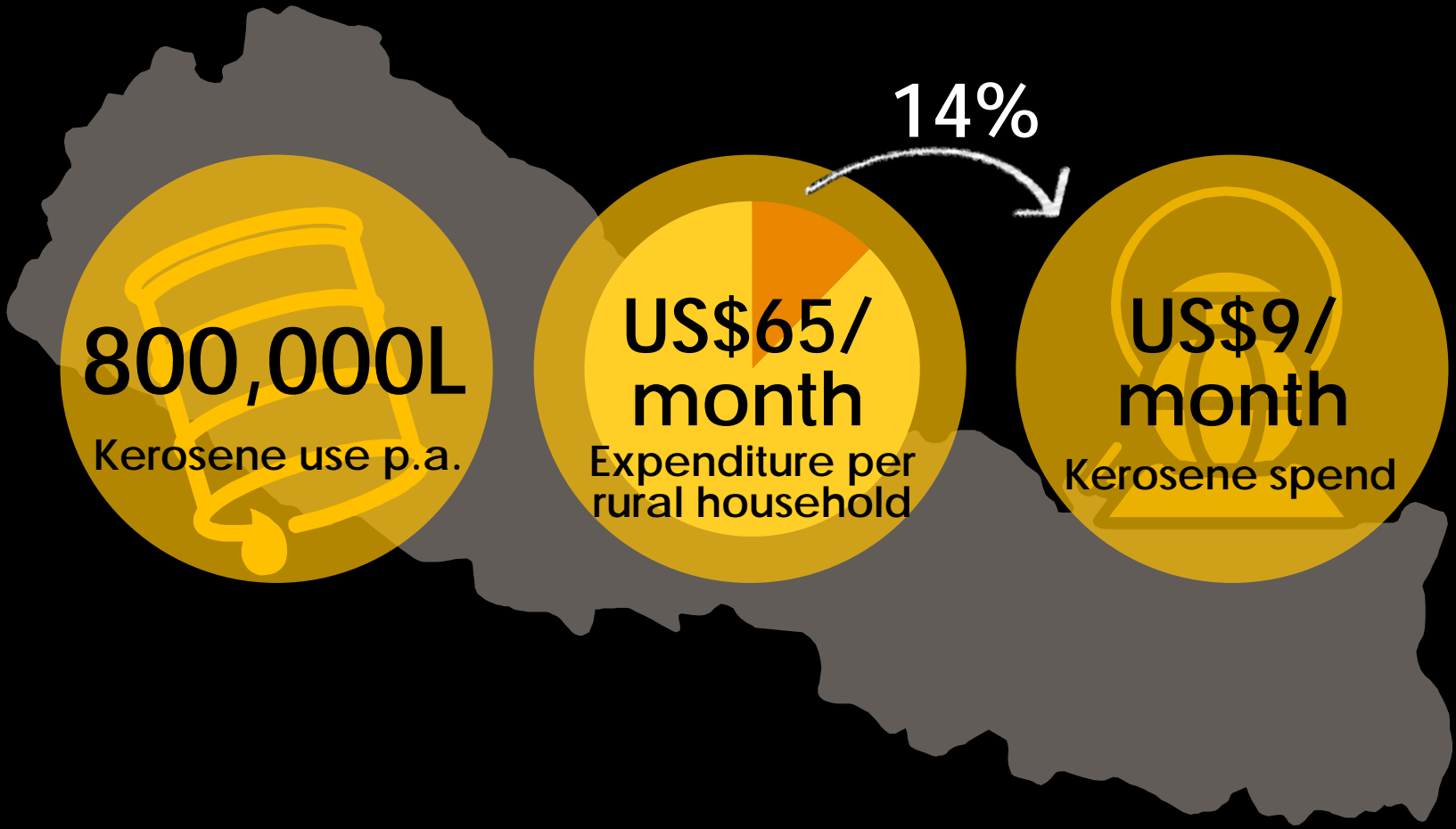
: a lamp or candle providing dim light during the night, for convenience , usually in children's rooms to allay night terrors

NEPAL Today



Sources: International Finance Corporation; FAO/WFP Food Security Assessment Mission to Nepal

NEPAL in need



Why Nepal?

**No Kerosene
subsidy**

prices are high,
distribution is
poor

**Government
support**

for Solar Energy
Solutions

**Existing Solar
Ecosystem**

**High Market
Potential**

Untapped

Our Vision

BETTER LIFE,
BRIGHTER FUTURE

Power another 36,000 off-grid homes in Nepal by 2016

Bring to market innovative and sustainable Solar Business Models



Why Solar?

KEROSENE ISSUES

Health Hazard
Exhaustible
Poor quality light
Bad for environment

SOLAR SOLUTIONS

Safe
Renewable
Brighter light
Clean

Solar Landscape

	HH INCOME <US\$65	HH INCOME >US\$65	CURRENT SITUATION
High Population Density	Micro Grids		<ul style="list-style-type: none">• High investment• Active private players
Low Population Density	Solar Lanterns (<3 Wp)	Solar Home Systems (SHS, 10-40 Wp)	<ul style="list-style-type: none">• Lower Investment• Relatively low penetration
		PHASE 1	

Economics are
viable

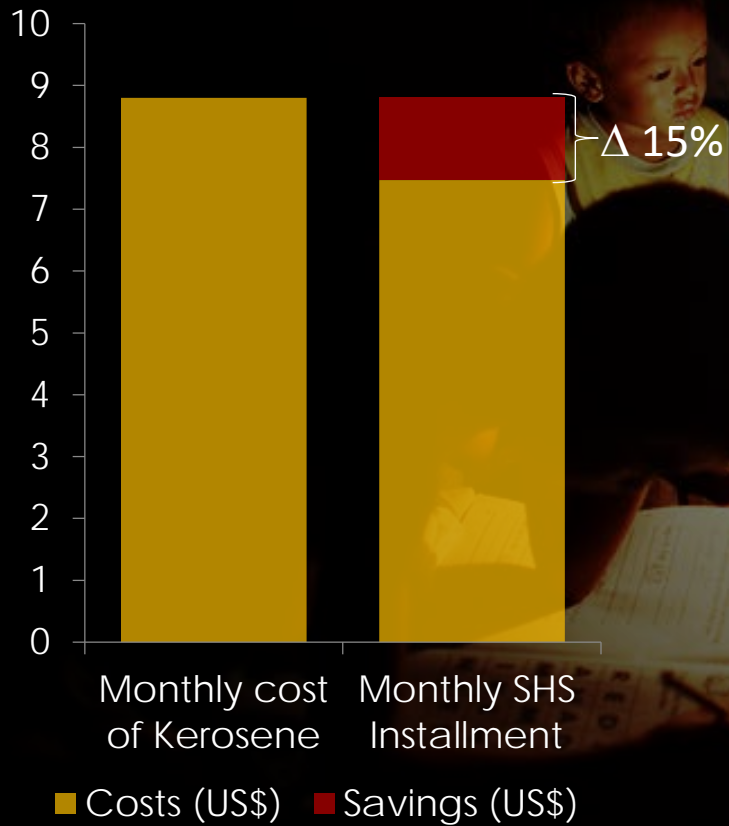
Greater scope
of benefits:
lighting +
communications

Why start with SHS?

Long term
commitment to
solar energy

Simple to implement

Why it works for rural Nepal

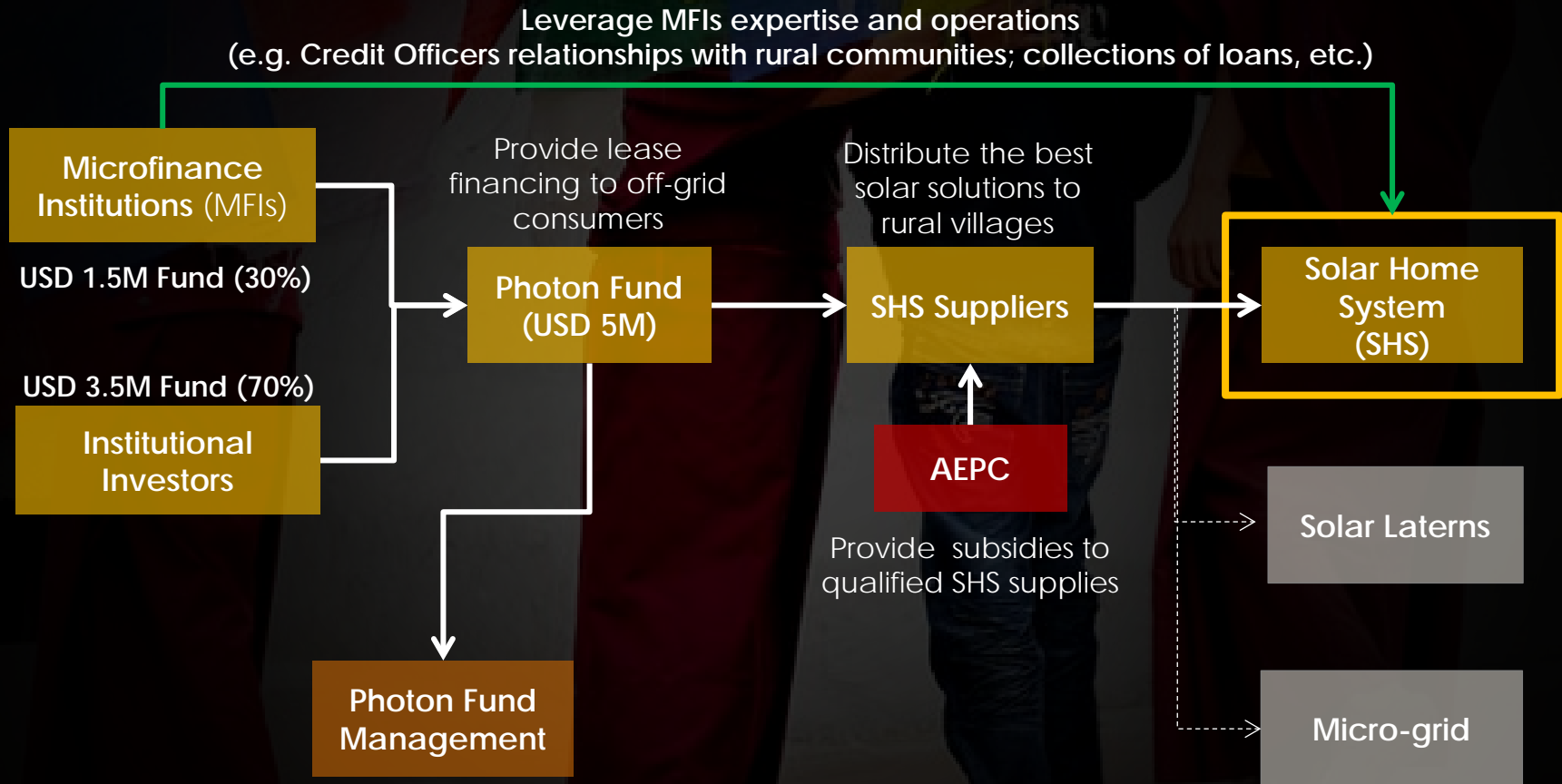


Non Financial Benefits

- Productivity
- Health
- Safety

Zero Upfront Cost

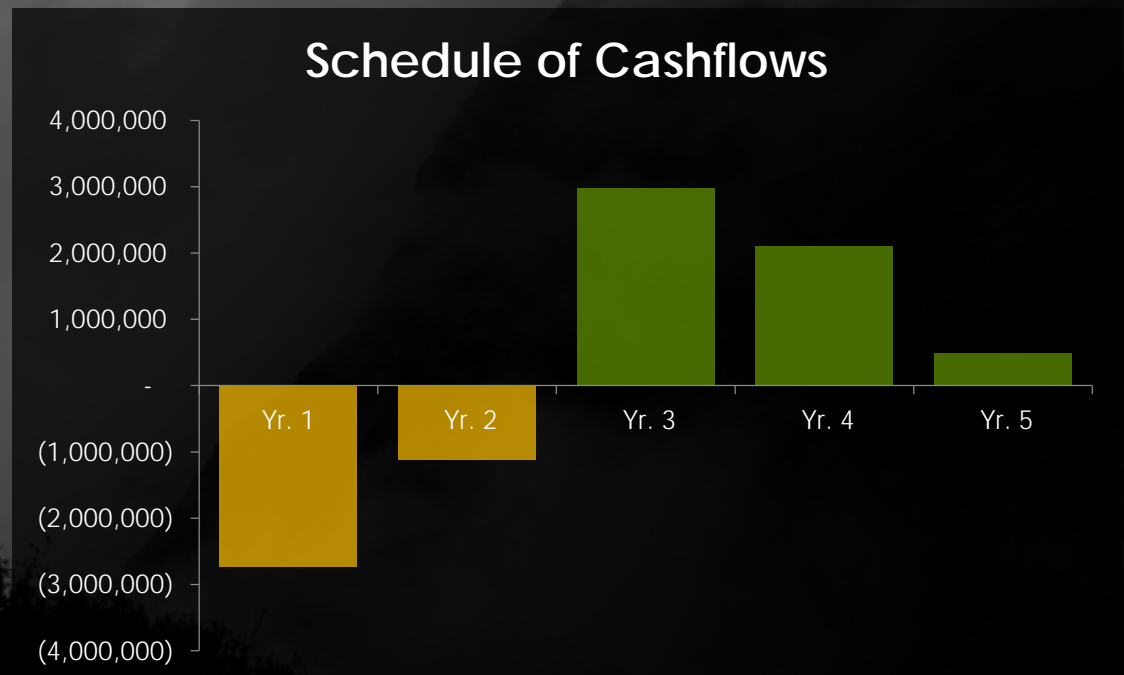
Photon Fund Model



Financials for Phase I

Returns	
NPV	US\$187,811
IRR	12.6%

Assumptions	
Fund Size	\$5,000,000
Interest Rate	30.0%
Cost of Funds	10.0%
Bad Loans Rate	3.0%
OPEX Rate	7.0%



Impact Measurement

ENVIRONMENTAL

Clean environment

Carbon emissions reduced per year

SOCIAL

Better health and safety

Number of fire accidents reduced per year

Better education

Number of homework and school attainment increased

Better productivity

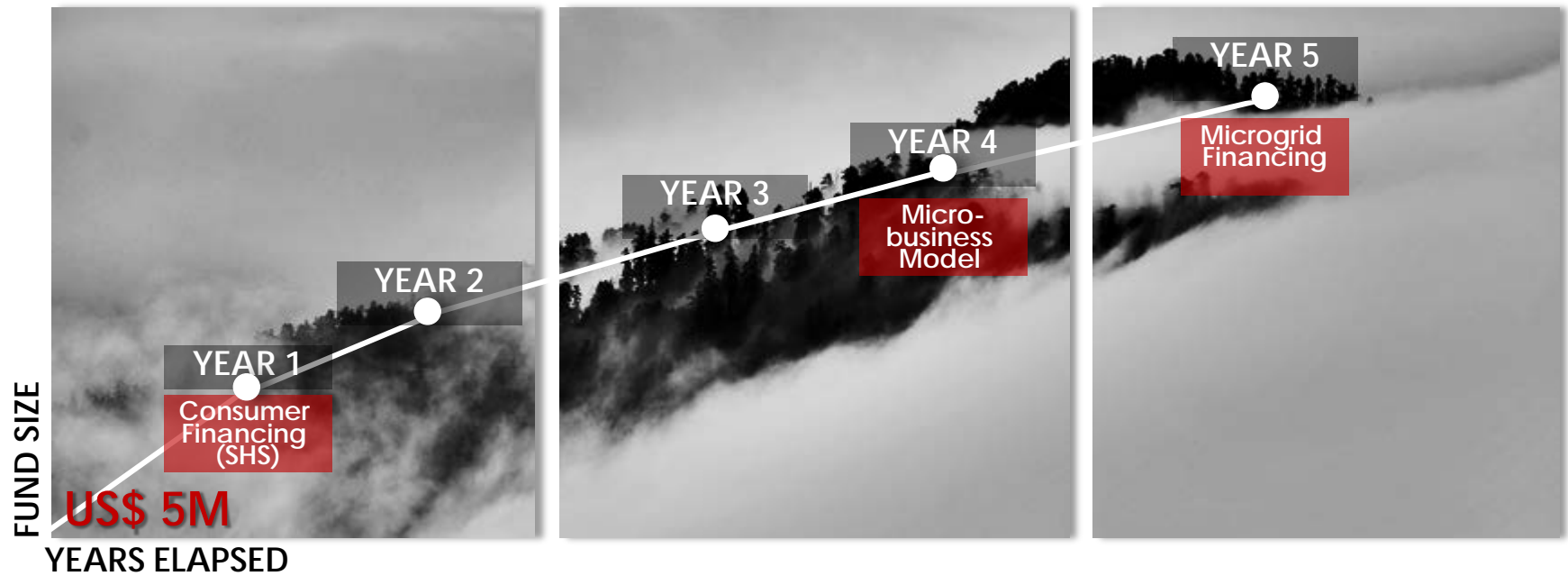
Number of usable energy hours increased per day

Access to Information

Number of mobile, radios, TVs, home appliances, increased per household

SUSTAINABLE

Established bank-MFIs relationship



ROAD MAP

Risk Mitigation

Reliance on solar subsidies

Rally AEPC grant funding support

Creditworthiness of households

Leverage MFIs expertise

Difficulty to reach-out remote areas

Leverage MFIs, micro-entrepreneurs with local knowledge

Durability of SHS

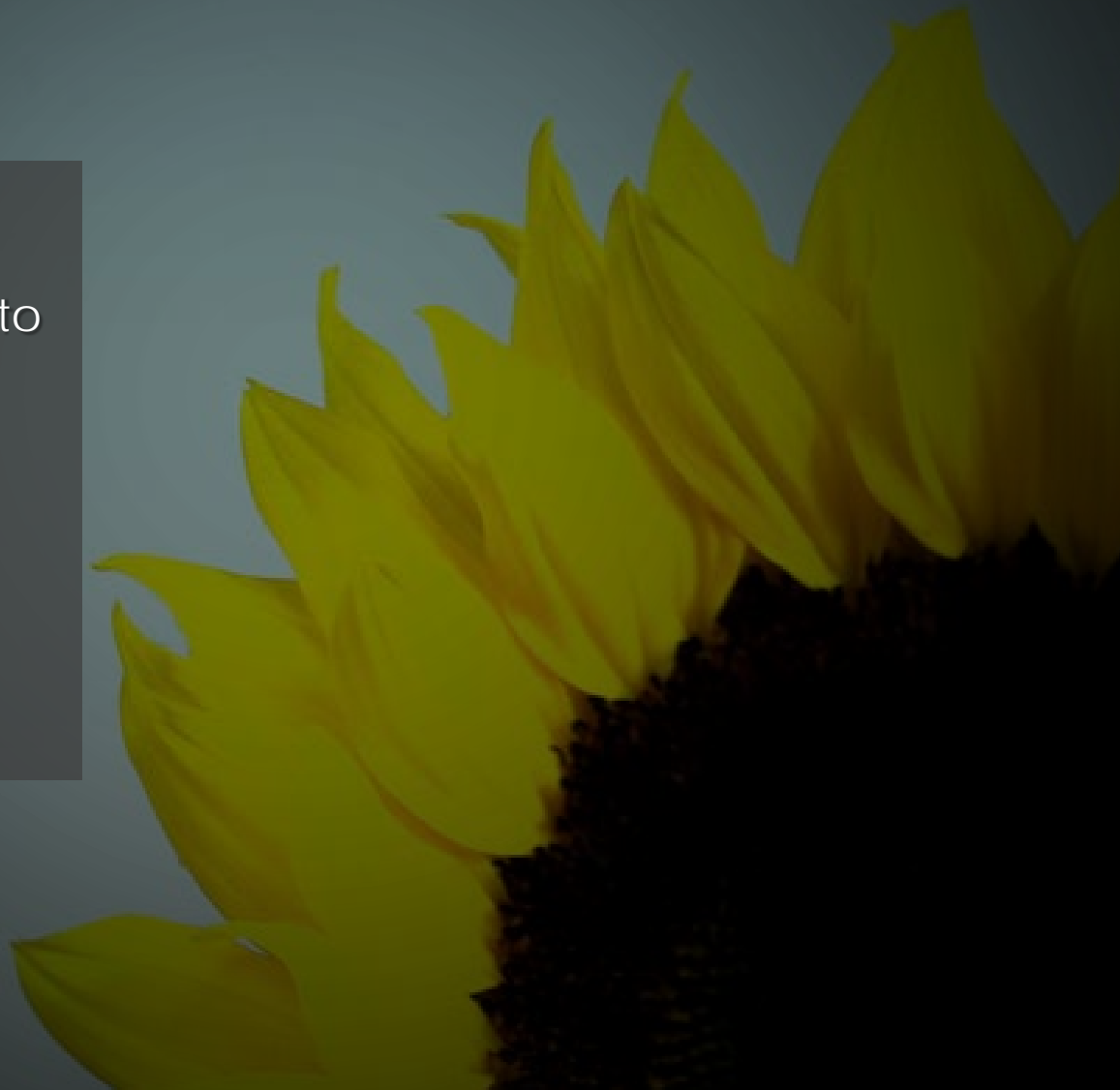
Mitigated by rapidly improving technology; suppliers due diligence

Poor/ Inclement Weather

Explore utilizing better battery technology, hybrid systems e.g. hand-cranked generators

Next Steps

- Reach out potential MFIs to initiate dialogue
- Identify potential SHS suppliers for target areas
- Engage institutional investors



Thank you



Appendix

Financial Assumptions

Fund Parameters	
Fund Size	\$5,000,000
Cost of Funds	10.0%
Management Cost	2.0%

Typical MFI cost of funds
Typical management fee

Loan Parameters	
Loan Amount	\$176.00
Tenor	3 years
APR	30.0%
Monthly Payment	\$7.47

Funding net price of SHS
Short-term consumer loan
Typical MFI interest rate

Portfolio Parameters	
Bad Loan Rate	3.0%
Operating Cost	5.0%
Booking Period	2 years
Number of Loans	36,000
Loans per Month	1,500

Typical MFI bad loans
Sharing cost with MFI ops
Loans booked in 2 years

Solar Home System	
Price	\$220.00
Subsidy	\$44.00
Net Cost	\$176.00

Average SHS price
Fixed AEPC subsidy

Kerosene Expenditures	
Monthly Spend	\$8.80
Monthly Savings	\$1.33
Lifetime Spend	\$316.80
Lifetime Savings	\$47.83
Savings Rate	15.10%

4L at \$2.2 per L

Appendix

Organizations in the space*



SunFarmer
powered by SunEdison Rural Energy



Name	Function
Alternative Energy Promotion Centre (AEPC)	Government entity promoting alternative/renewable energy.
SunFarmer	Energy access for critical services organizations like schools and hospitals.
Gham Power	Solar system and microgrid solutions for business and community.
Empower Generation	Empowerment of clean energy entrepreneurs.
Winrock Nepal	NGO providing technical expertise/capacity building for energy projects
Commercial banks, microfinance firms and cooperatives	Loan financing.
Solar system providers	Installation and maintenance of solar home systems.

*Partial list.

Appendix

References

Main References

- International Finance Corporation, Lighting Asia: Solar Off-Grid Lighting (2012)
- Elizabeth Tedsen/ Eco Logic, Black Carbon Emissions from Kerosene Lamps (2013)
- Steve Dahlke, Solar Home Systems for Rural Electrification in Developing Countries (2011)

Main Interviewees

- **Binod Shrestha**, CEO, Winrock Organisation, Nepal
- **Harish Hande**, Co-founder in SELCO India & Advisory Board Member in Morgan Stanley Institute for Sustainable Investing
- **Prem Subedi**, MFI consultant, Nepal
- **Sandeep Giri**, CEO, Gham Power, Nepal