

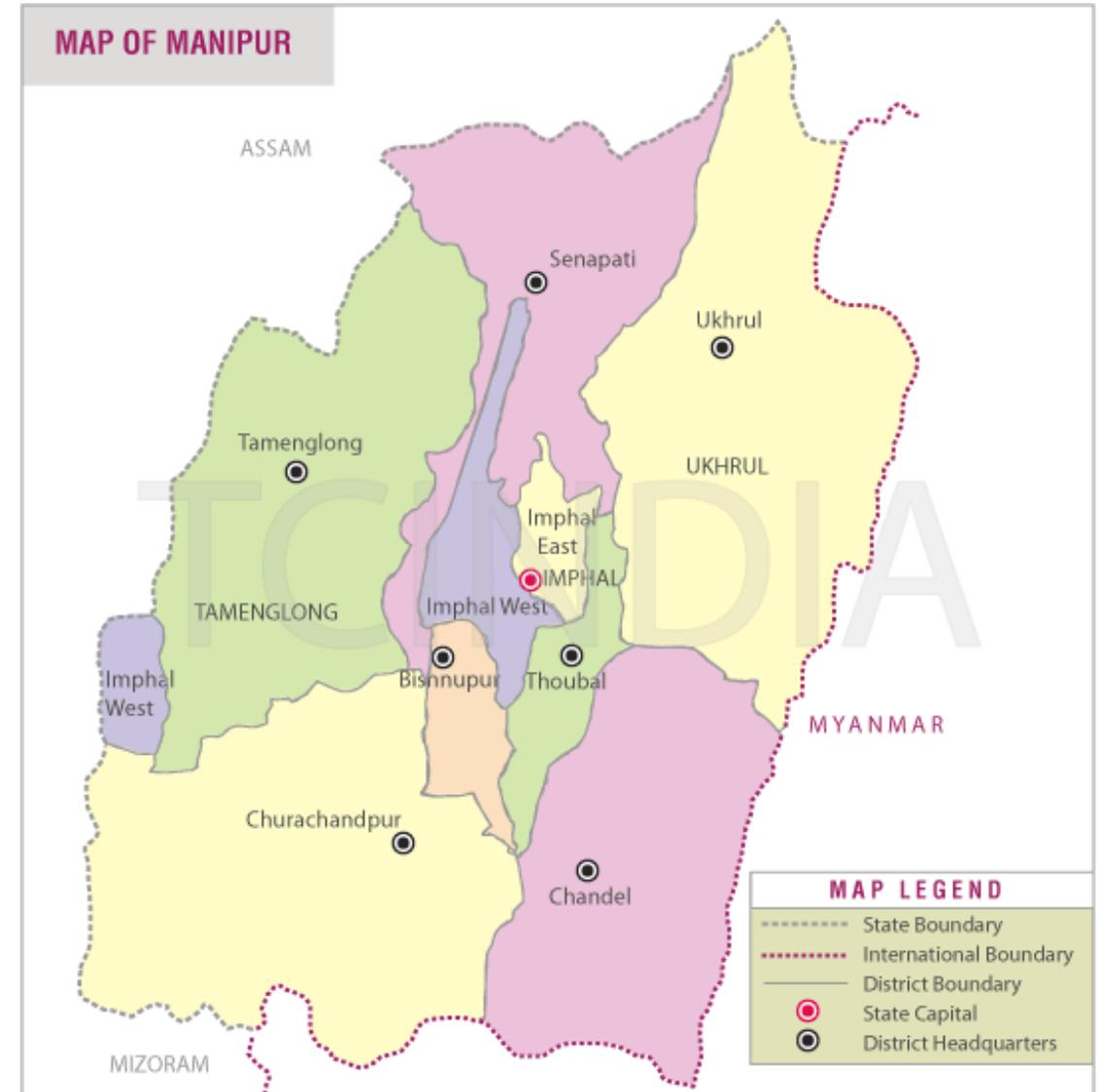
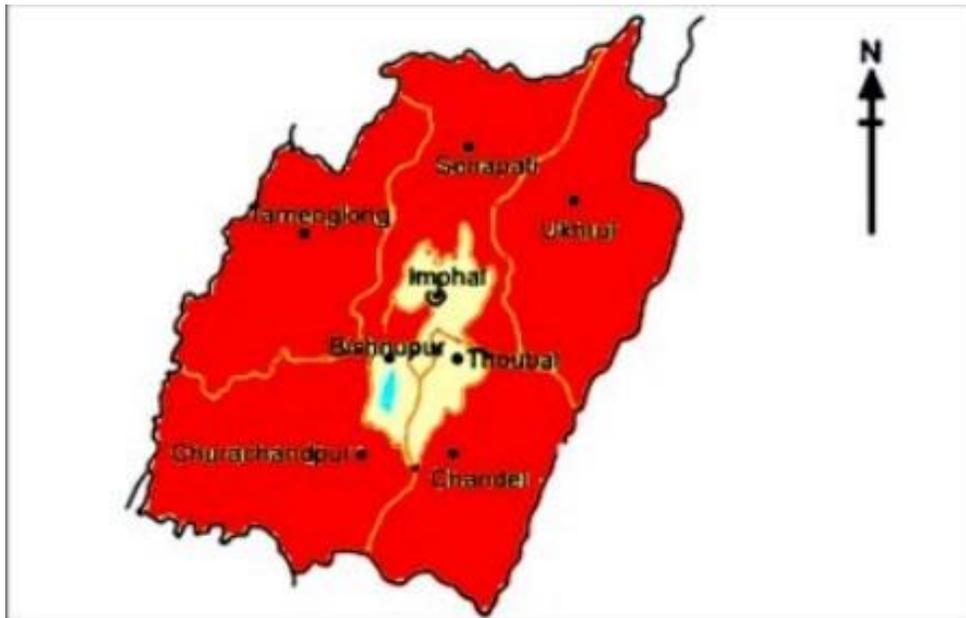


Mangaal Sustainable Solutions Private Limited

“sustainable energy products and services **available and affordable** to all – especially the **underserved population**”

About Manipur

- Situated in the extreme **North Eastern** corner of India.
- Just **22,327** Sq Kms in size, and is divided into 9 districts.
- Physically, two distinct regions - hills and valley.



Screenshots of News Articles



TNT
the northeast today
THE LEADING PUBLICATION FROM NORTHEAST INDIA | HOME | FEATURES | OPINIONS | THE LOUNGE |

Home » News » Manipur to solve severe power crisis for 60,000 households

Manipur to solve severe power crisis for 60,000 households

Published on October 15th, 2013

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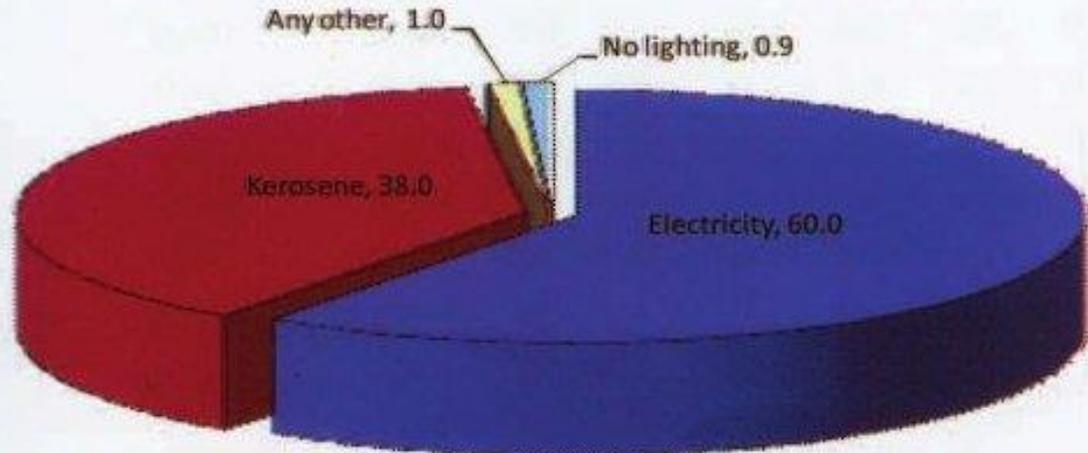
Myanmar unhappy of Manipur over failure to supply power

Source: Hueiyen News Service

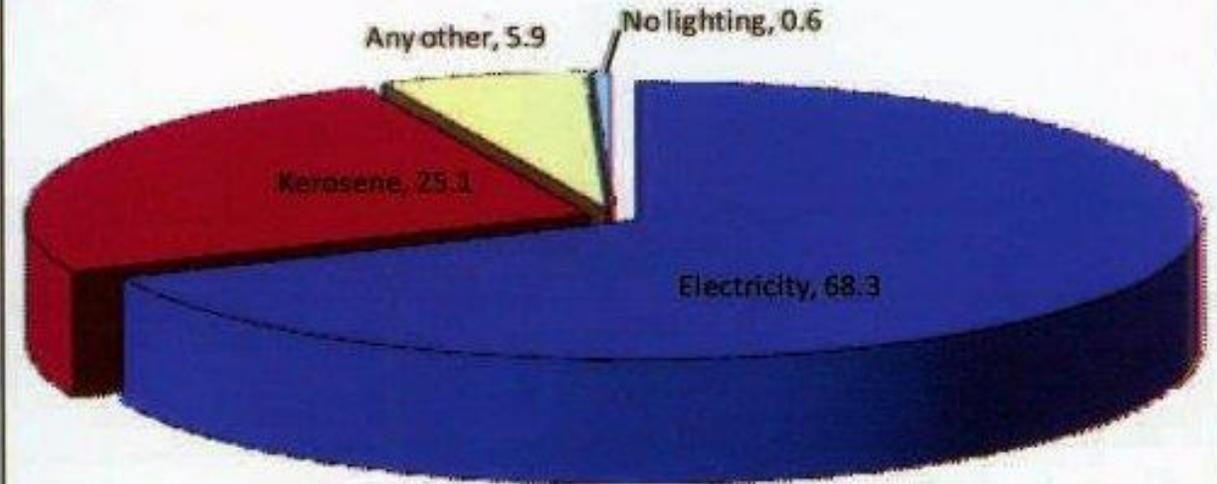
Imphal, November 01 2013 : Myanmarese authority has made known its displeasure to the Government of Manipur for not giving a positive response to the proposal for purchasing 3 megawatt of power to light up its Tamu township.

CENSUS REPORT ON 'SOURCE OF LIGHTING'

Main source of lighting, Manipur, 2001



Main source of lighting, Manipur, 2011



OUT OF 53 DISTRICTS IN INDIA WHICH HAS MORE THAN 2% OF THE HOUSEHOLDS USING SOLAR AS THEIR PRIMARY SOURCE OF LIGHTING, 4 DISTRICTS ARE FROM MANIPUR!

The Energy Problem in Manipur



RGGVY Data about Manipur

Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY)

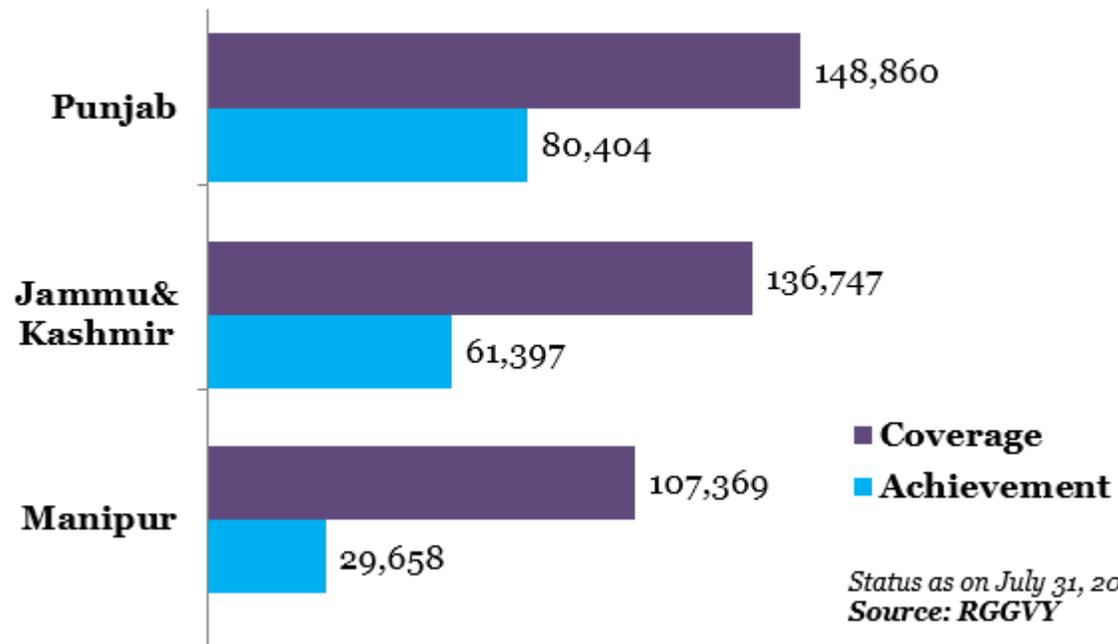
Ministry of Power

What Is It?

* Rural Electrification Programme; Launched April 2005

* To create Village Electricity infrastructure (VEI) in un-electrified villages & to strengthen electricity infrastructure in partially electrified villages

3 Worst Performing States Under RGGVY



Reports: [State-wise](#) > [District-wise](#) [Print](#)

Number of Villages Targeted for Electrification / Intensive Electrification under RGGVY (State : MANIPUR)

S. No.	District	No. of Un-electrified & De-electrified Villages taken up for Electrification	No. of Previously Electrified Villages taken up for Intensive Electrification	Total
1	CHANDEL	156	192	348
2	SENAPATI	236	0	236
3	TAMENGLONG	53	79	132
4	UKHRUL	58	124	182
5	OTHERS	0	0	0
TOTAL OF ALL DISTRICTS		503	395	898

Note: Remaining data is being uploaded.

List of unelectrified village in Manipur as on 31-10-2013

318

Source:

<http://rggvv.gov.in>

http://www.cea.nic.in/reports/monthly/dpd_div_rep/village_electrification.pdf

From our initial research on the market

Reliable power for less than 5% of the households only:

- Few people with access to the so-called VIP connections, most of them illegal.
- Few pockets of Imphal where Prepaid Meter Systems has been introduced.

For the majority:

- Power for only about 8-10 hrs/day maximum, these to in packets of 2-3 hours each.
- These power supply also comes at very low voltage, making it unusable for many appliances -
- Major hardship for those in the far off hill areas which are electrified, but very unreliable supply.
- Less than 3hrs in many areas, and goes off for as long as 6 months... in case anything happens to the transformer or the transmission cables.

The current alternatives/solution people have

- **Inverters and batteries.**
 - Very popular, before solar happened.
 - Almost every house of a middle class family has an inverter.
 - Mostly from Myanmar, both inverters and batteries.
 - Now unpopular
 - Because of inability to charge the batteries fully.
 - Most people are now aware about solar solutions, which they consider to be better than very-unreliable grid.
- **Diesel Generators.**
 - Mostly used for businesses, farming & agriculture, etc.
 - Costly but, there are no reliable alternative.
 - Diesel not easily available during blockade, bandhs, which are frequent. Causing a lot of problems.
- **Kerosene lamps, Candles.**
 - Mostly used in very poor households and also by women vendors in late evening.
- **Small lamps, both solar and grid rechargeable ones.**
 - Very popular, esp cheaper models from Myanmar.
 - Almost all houses has a few of those.

Solar is the becoming most preferred solution now

The solar market – The Sellers

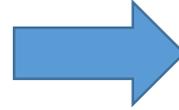
- Many unorganized players & shops selling solar products, mainly in Imphal.
- Very few organized firms, some working only for big & profitable projects.
- Many individual entrepreneurs buying from the Imphal market or from outside the state and selling among their community and locality. Small lamps mostly.
- Products broadly classified into two types – “Indian Product”, “Moreh Product”.
- Lots of brands because of the porous border with Myanmar -> the Moreh Products.
- Huge price range - panels costing between Rs 40/watt to Rs 110/watt for solar panels.

The Sellers – In Pictures



The solar market – The Buyers

- Everyone **has someone they know** – relative, friend, neighbour, etc - who has installed/used solar.
- Most localities, villages have got **Solar Street Lights** – installed by the Panchayat, MLAs, etc.
- Many **government departments, most CHCs, few bank branches**, have already got solar installed.



- Very **high awareness** about Solar Solutions.
- About the various **types of products** available.
- Adding to this are various **ads** about solar **almost daily**.
- Some ads, with almost **impossible promises(?)!**

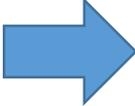


uninterrupted power/uninterrupted performance
EXIDE SOLAR HOME LIGHT
MEGA EXCHANGE OFFER FROM EXIDE
Bring your old 3K/Top/Yuasa/GPAmron/Lumminous/Su-Kam Any Batteries.
Affordable, Reliable
10 Years warranty
Special Service for Marup Agent
2nd Phases
Scheme Offer just pay ₹26,000 and rest amount in easy EMI only 50 members packages.
0% interest for ₹ 48,200/-
Contact No. 9862761303

Price Starts from	Features
₹ 13,850/-	Two lights
₹ 14,350/-	Three lights
₹ 15,550/-	Four Lights
₹ 29,550/-	Work Loads
₹ 34,550/-	T.V. Computer
₹ 45,575/-	Water Pump Washing Machine

FREE HOME DELIVERY INSTALLATION FREE

SAVES
1. Electricity
2. Petrol
3. Diesel
4. Save Energy

- Mostly cheap, low quality products being sold because of the price war between sellers.
 - No customization/design based on actual need.
 - Installation, in most cases, is done by the customers.
 - No reliable after sales service, no maintenance contract or AMCs, more so in difficult to access hill areas.
 - No organised end-user-financing options for the poor.
 - Shops present mostly in Imphal area and not in the hill districts, where the energy problem is more severe.
 - Some agencies & individuals giving solar lamps for free.
- 
- Worse quality products to places where best quality products should be going.
 - Good payback on the solar solution not guaranteed. Battery and panels are oversized/undersized in most cases.
 - No proper cabling, panels facing the wrong direction, unsafe installation.
 - Short life of the battery and other equipments as they aren't maintained properly.
 - Poor people in rural areas, those who needs solar the most, aren't able to buy solar as they cannot afford them.
 - Also because these solutions aren't easily available. Often times, they are paying a lot for transport.
 - 'Beneficiary' mindset rather than that of 'customers'

Mangaal's Business Model

- A social enterprise, a for-profit firm. Have 'customers', not 'beneficiaries'.
- A **system integrator** providing customized solutions based on actual needs, not a manufacturer.
- Focus on **quality products & good service** through trained technicians & system designers.
- Establish **financial linkages** for end consumers, to make **solar solutions affordable**.
- Partner with NGOs, Village Authorities, Churches, Civil Society Organizations and other like minded organisations to increase the reach of our service in far flung, which are otherwise difficult to access.
- Continuous effort at new innovations in products & business models to solve various energy access problems.

Why a for-profit social enterprise, not an NGO?

- We have customers and not beneficiaries.
- Customers can make a choice of what product they want. Products which they need, whose utilities they understand.
- Customers pay for the product, and hence are entitled to good product and service. If the same is not provided, they have the right to complain and demand the same. Beneficiaries cannot.
- When you buy a product with your hard earned money, you care for and maintain the product so that you get the maximum benefit out of it. Things you got as 'charity' don't have the same value.

Business Model - Mangaal



System integrator, not a manufacturer

- We are not tied to only one supplier/vendor.
- Flexibility to choose the best products - based on both quality and price and other factors.
- Able to change suppliers, if there is any compromise on quality by a vendor.



Business Model - Mangaal



Customised solutions, based on actual energy requirements

A typical sales at Mangaal



Customer's Problem



Consult & suggest the best solution



Quality installation by trained technicians



There are no set system designs as we customize based on needs of the customer. As of now, we have provided systems between **40Wp - 200Wp based systems for Home Lighting Solutions.**

Solution provided



Financial Linkages to make solar solutions affordable

Efforts to link end users with financing for their solar solutions.



Customers won't have to pay upfront but through easy installments, making the 'supposedly costly' systems affordable.



- We have signed an MoU with the Manipur Rural Bank (MRB) because of which customers of MRB can now enjoy 'Solar Loan'. From Oct, 2013 onwards MRB has given 150 solar loans.
- We are working with 3 MFIs to distribute Small Solar Lamps, so far 300 lamps have been distributed.
- We are talking to other banks & MFIs to facilitate more end-consumer financing.

Who has financed Mangaal?



- Investment bought in by the founders, amounts ranging between Rs 10,000 – Rs 150,000 (~ 200 – 2500 USD) bought in from time to time, as and when there was an immediate need and when the founders had money.
- Some gap-funding for new business model innovations from the incubation centre.
- Consulting income from the incubation centre.
- Interest free loan from the Incubation Centre to meet working capital requirements.

- Applied for a loan from a bank.
- Will be trying for some innovations challenges/competitions to access some soft funds.
- Looking for have to look at further investments to fund the expansion into new areas of service, add new products and to add more talented people to the team.

- Direct cash sales has mostly been through brand & trust building awareness programs.
- Majority of the financed sales has come from the financers themselves – the bank, MFIs.
- Access new markets through organisations who already have good reputation and presence in the areas we are trying to enter.
- Partner with other agencies who are also trying to address the energy access problems.
- Through word of mouth.

Sales and marketing - Mangaal?



Awareness about proper design, usage and maintenance about solar products.



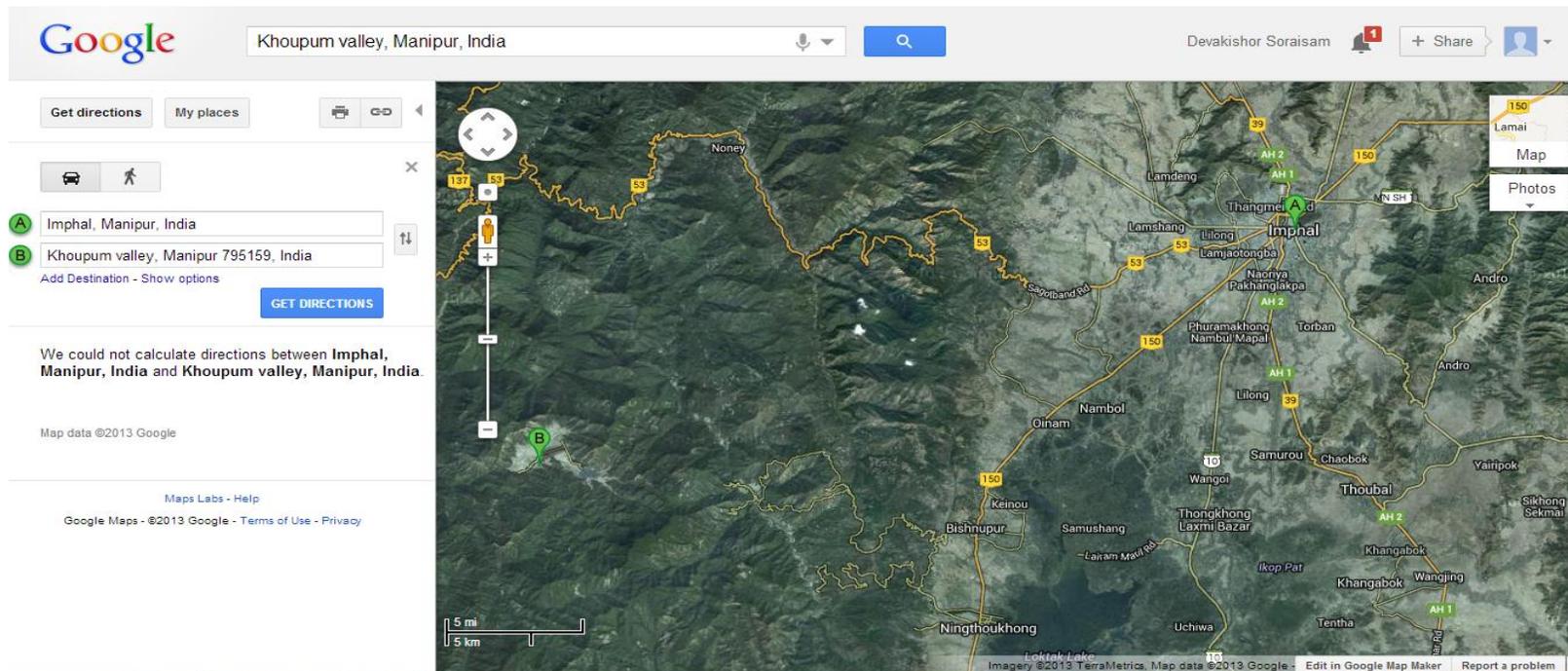


Distribution / Channels - Mangaal



- We have one branch and a head office now.
- All installations, sales and service are happening through the Imphal branch now.
- Will be opening another branch within the next two months, in Churachandpur, a hill district.

A very important we learned the hard way.



Sell the products in only those areas where you can service it.

Whatever Mangaal is today, it is because of the awesome team

- Only those people who can relate to, and share the vision of Mangaal joins the team.
- We are not very particular about degrees and qualifications, so far it has worked out fine.
- Someone with integrity, a curious mind and having a willingness to learn is what we look when we look for new team member.
- Reference from existing team members, when looking out for new people, have out well for us.
- People with prior experience in similar working environment or similar roles/responsibilities brings in a lot to the organization, more so as we are just starting up.
- Having team members of different skillset, qualities is a must.

What motivates team Mangaal?

- Everyone's voice is heard when it comes to taking important decisions, we are more like a family.
- More than the salary they get, seeing people experience the impact of the work they did.
- Good feedback, words of appreciations from partners and customers.
- Like minded people working together.
- Seeing how different Mangaal is from the other players in the same market.
- After knowing how much Mangaal has changed in the past few months, after seeing where other similar organisations are now, and looking at the prospect of future growth – for both Mangaal and them, together.

Has incubation/mentorship helped?

- Were fed up with the energy problem, wanted to do something to address it. Didn't know how.
- Knew about solar as a possible solution but, had no clue about the industry, the various products and solutions available.
- Not just the renewable energy industry, we are new into business as such – we are first generation entrepreneurs.
- Financially, not from a well to do background.

Looking at the above facts and considering we have survived almost two years and are going strong in this cruel industry, I guess, the answer to the above questions is a big

YES!

Market Research and Business Model

- Helped us answer the most basic question – Will solar solutions make sense here?
 - Solar irradiance.
 - Sunny hours per day, rainy days in a year.
 - The energy problem in Manipur.
- Understand the actual requirement
 - Field surveys.
 - Studying the current alternatives including the existing solar market.
- Helped Mangaal arrive at the business model that we think will work in Manipur.
 - Exposure to many different business models, different case studies.
 - Experimented with a few.
 - Zeroed in on the model we are following today.
- Continue to help us improve on the business model and streamline operations with using new tools.

Vendor linkages, Supply chain

- Who are the reliable vendors who provides good quality products and service?
- A new and small firm dealing with big and established manufacturers?
- Conflict resolutions with the vendors, in case of any issues.
- Correct product specifications, quality certificates, service record, price comparision.
- Help with important negotiations like – warranty terms, service agreement, etc.

Technology

- Training on the basics of the Solar PV Technology.
- Proper system design based to suit the environmental & climatic conditions of our area.
- Designing solutions depending on load and usage pattern, autonomy required.
- Hands on training for one of Mangaal's technician on quality installations, maintenance and basic trouble shooting at one of SELCO's branch.
- Exposure to various new technologies and innovations that are being tried out, for possible replication by Mangaal.
- Access to the engineers and technicians of SELCO whenever team Mangaal has any query on anything to do with the solar PV technology.

Establishing Financial Linkages

- Leveraging the good network SELCO has with many banks to make end user finance available for customers in Manipur.
- Through programs like 'Bankers Training' jointly organized with NABARD.
- Training and know-how for Mangaal team various schemes of the government through which financial linkage is possible.
- Visit by SELCO Incubation team and their consultants to help build confidence for the bankers to work with a very new firm – Mangaal.

... and in many other ways

- Starting from basic things like 'accounting'.
- Networking and visibility that matters: MNRE, GIZ, UN Foundation, USAID, et al.
- Access to many more learning opportunities like this event.
- Help with fund raising, various methods, processes involved, etc.
- Connect with other startups/incubates to share experiences and help each other out.

And, most importantly.

**A mentor who is almost always available,
whom we can reach out to,
even at 3:00 in the morning 😊**

Challenges, and what we are doing about that.

- Financial linkages, in the absence of banks.
 - Small local entrepreneurs, revolving funds.
 - Marups
- Enterprise financing from local banks.
 - Incubation Centre helped in building relation with the bank.
 - Help the bankers on the processes, rope in experts from the field.
 - Security, guarantee for the funding from Incubation Centre.
- Insurgency issues and how it has impacted Mangaal's business model. How did we tackle it?
 - Work/partner with known/reputed organisations from different communities.
- Cheaper imported products.
 - Stayed away from the price game, focused more on the service and quality products.
 - Create a brand. Difficult in the beginning, but pays off later.
- Lack of vendor linkages.
 - Do not rely on just one vendor, work with multiple sources.
 - Difficult when small, but a little better when you start to grow/expand.
- Distance, remoteness and general terrain of Manipur.
 - Learned the hard way and decided to 'only sell in areas where we can service'.
 - Build local capacity to help with basic maintenance & service.

Few Innovations we are working on

- Solar Powered Sewing Machines.
 - DC Motors for sewing machines.
 - More power efficient sewing machines with inbuilt motors.
 - Solar solutions for the above are cheaper than designing for less power efficient AC motors.
- Solar powered water pump for fish farms.
 - Designing a new product to suit their usage.
 - To compete with diesel, financially.
 - To increase their productivity and increase income.
 - Trying to link him with bank finance for the Solar Water Pump.

Mangaal focused more on getting some regular sales, cash flow to make the business sustainable and then trying out new innovations.

Replicate the Incubator/Other-firm?



Will we replicate SELCO as a whole, as it is?

NO!

- Different region, different people, different requirements, different set of challenges.
- Take the best of what we can, improvise and prepare our own models and methods.

Milestones – Mangaal



- First sales of SHLS in April, 2013.
- Just 8 months after incorporation, signed an MoU with the Manipur Rural Bank to finance SHLSs.
- Till date, installed Solar Home Lighting System for 200+ households, 175+ through bank finance.
- Sold 500+ Solar Lanterns through MFIs.
- Successfully installed & commissioned a 2.25Kw solar solution for a TB diagnostic centre near Yangon, Myanmar in April 2014.
- Closed the first financial year making a profit.
- Already done about 80% of our last year sales figure, sales in the first two quarters of 2014-15.
- From one tiny branch/shop, shifting the admin team to into another office at the end of September, 2014.
- From a team of two, we are now a family of 10 very committed individuals.

The road ahead...

- Expand to other underserved areas of Manipur.
- Establish presence in Other states of North East India.
- Work in bordering towns/regions of Myanmar.
- More innovations, not just to address 'lighting' issues but to also provide energy for other livelihood activities , businesses and for some small luxuries –TVs.
- Some projects to address village/community level issues (Cold Storage? Rice Mills? etc)
- Explore other forms of sustainable energy, for places where they make more sense than Solar. – Biomass, Micro-Hydro, etc.



mangaal

Thank You!

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