To develop mobile solar power (mobile URJA) units that will deliver affordable and sustainable energy for irrigation with universal charging option resulting in a simplified rental model having multiple uses.
PoW
Pumps on Wheels Challenge: It is difficult to move deeper into the fields

Mobile URJA
Larger pumps with one supercharger; panels transported where tractors can go – no investment in panels at the site.
Mobile as a “fuel” - no battery, no recurring cost - provides opportunity for new entrepreneurs.
Beyond Irrigation: It can provide power to processing units, Home use etc
Portable Pump- Sharing Model
Innovation

KARMA+FLISOM
Customised Solar Panels
CIGS Copper Indium Gallium Selenide Technology
Universal Controllers
MPU Mobile Power Unit
IOT Agri-UBER
MOBILE URJA
Affordable Irrigation
Rental Power
Entrepreneurial Opportunities
Improved Income for BoP Farmers

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Implementation

**Current Implementation Location**
- Uttar Pradesh
- Koraput (Odisha)

**Implementation Partners**
- FARMER SOLAR CLUB
  - formed for entrepreneur model

- Design Robust & Lightweight rugged panel on CIGS
Addressing The Climate Change
Sustainable Development Goals; SDG 5 (Gender Equality), SDG 6 (Clean Water), SDG 7 (Affordable & Clean Energy), SDG 13 (Climate Action)

Current Scenario
Diesel Irrigation
Over Utilization of Groundwater

Proposed Scenario
Solar irrigation
Sustainable Utilisation of underground water
Gender & Social Inclusion

Providing year-round irrigation brings at least 1 lakh income for farmers. (Source: Study conducted by Pragati, Koraput and independently by others like Xavier Institute of Management, Bhubaneswar.)

Additional Income generated if farmer owns Mobile Urja (Through bank finance) by leasing it.

Sustainable Shared model for marginal farmers & technology-based sharing platforms for more inclusivity.

Through partnerships with Pragati & SPARSH by JK, KARMA is reaching out to women farmers who constitute at least 50% of total farmers.

In tribal areas like Koraput, majority of field work is done by women.

Through SPARSH, We plan to build micropreneurs who will manage Mobile Urja, Majority of them women.

<table>
<thead>
<tr>
<th>Upfront irrigation cost*</th>
<th>Recurring irrigation cost* (yearly)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(INR 15,000)</td>
<td>(No running cost. Only rentals)</td>
</tr>
</tbody>
</table>

*All costs are compared per acre of irrigation with 1HP submersible pumps assuming water sources and borewells to be available.
Implementation Plan

Prototype Testing
Design & Prototype development of mobile URJA solar pump (0.5,1,2,3HP) with silicon technology

Milestone 1 (Month 0-Month 12)

Milestone 2 (Month 6-Month 24)

Field Testing
Field testing of atleast 10 mobile URJA units covering 50 acres of land
IoT integration

Milestone 3 (Month 12-Month 24)

Scaling Up
Scale up – atleast 30 business partners
100 acres irrigation with mobile URJA & CIGS
Use of mobile URJA in other activities

Milestone 4 (Month 18-Month 24)

More Testing & Networking
500 acres irrigation with mobile URJA
50 dealer networks

Milestone 5

Further Expansion to Different Regions

FARMER SOLAR CLUB- 2-10
Rs 24000- Rs 7500
5 Created –2 working in the ground - linked to Bank if needed- KfW credit.

Customized FLISOM panel is on the way- should reach by March 15.
OUR TEAM

Suraj Kumar
VP, KARMA
PhD, IIT Bhubaneswar

Saroj Nayak
MD, KARMA
Dean Faculty, IIT Bhubaneswar

Anurag Panda
Postdoc, MIT

Vladimir Bulovic
Professor, GridEdge Lab, MIT

Saroj Nayak

Frederico Guetta
Representative, Flisom
Thank You
Business Model

- **Mobile URJA**
  Customized flexible Silicon panels
  Mobile Power Units (MPUs)
  Universal controllers

- **Business Plan**
  100 dealers in network
  Product awareness
  Handholding of entrepreneurial initiatives
  Scope of $430 million business @ 10% market penetration

- **Customers:**
  Marginal farmers, SHGs, FPOs, Cooperative groups, CSR activities

- **End customer benefits**
  Affordable Irrigation
  Rental Power
  Entrepreneurial opportunities
  Improved income for marginal farmers

- **USPs**
  Mobile, rugged and affordable system
  State of the art technology
  On-site service
  IoT soil health monitoring

- **Gross profit margin:** 40%

- **Channels overheads:** 15-20%

- **Deliverables**
  10 mobile URJA platforms
  1000 acres mobile URJA irrigation
  Business of 2 crores above IUSTEF grant

- **Fund Requirements**
  2.50 crores (INR) for pilot
  12 crores for scale-up
  - Estimated revenues
    - First year: 18 lakhs
    - Second year: 90 lakhs
    - Third year: 2+ crores

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Business Model to Promote Entrepreneurship through Mobile URJA

- Estimated cost of mobile URJA Mobile Power Unit for an individual: INR 75,000 (1 HP)
- EMI: INR 2,445.00 (@11%)
- Number of yearly rentals: 300 (1 rental per day, 3 acres per day)
- Feasible charge per acre per day: INR 100 (cost incurred by diesel based pumps per acre per day: INR 110-120, considering 1HP model)

- Yearly minimal additional income: INR 90,000 (from irrigation alone)
- Additional yearly expenses: INR 6,000-8,000 (transporting of mobile URJA platform and maintenance)
- **Net minimal yearly profit:** INR 82,000
- Typical income from cash crops per acre: INR 1-2 lakhs