



MECS
Modern Energy
Cooking Services

Cooking Support On Mini-Grids (COSMO)

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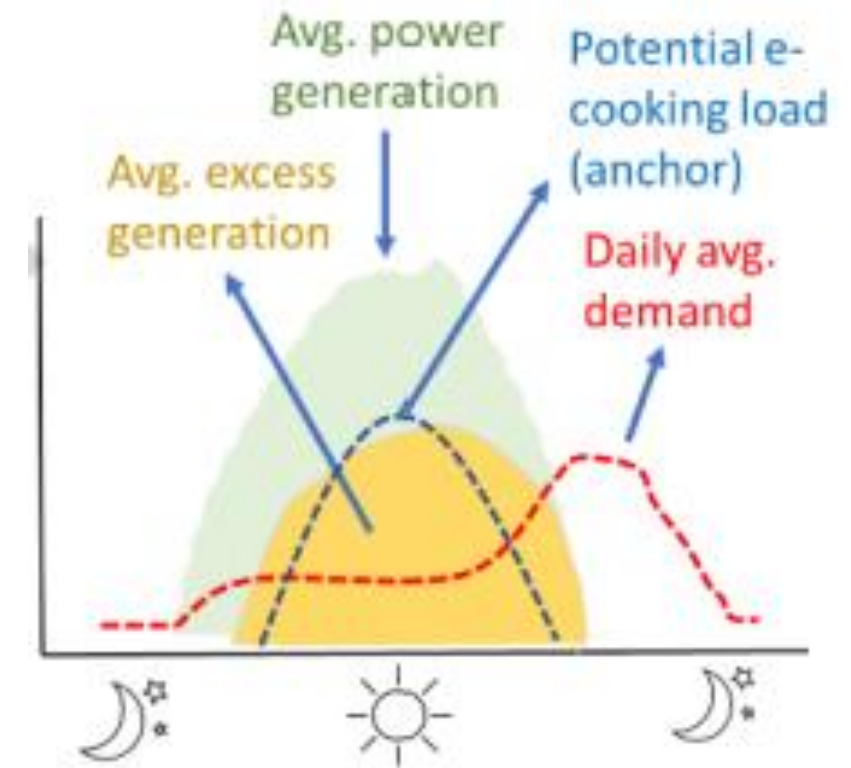


Why eCooking matters for mini-grids

- Mini-grids can struggle with low demand and weak revenue
- People already spend money, time and effort on cooking fuels
- eCooking can:
 - increase electricity sales – financial sustainability
 - save people money, time, and improve their experience

COSMO Phase 1 - see [report](#)

- 7 projects across 7 different countries
- **Business plans** for integrating eCooking
- **Technical and financial modelling** (load profiles, system sizing, cash flows, etc)
- 6 solar (3 new build portfolios, 3 existing mini-grids, one micro hydro)
- Methods: surveys, interviews, focus groups, modelling, trialling eCookers



Conceptual framework. Credit: Soton University

PowerHut, Tanzania solar mini-grid portfolio



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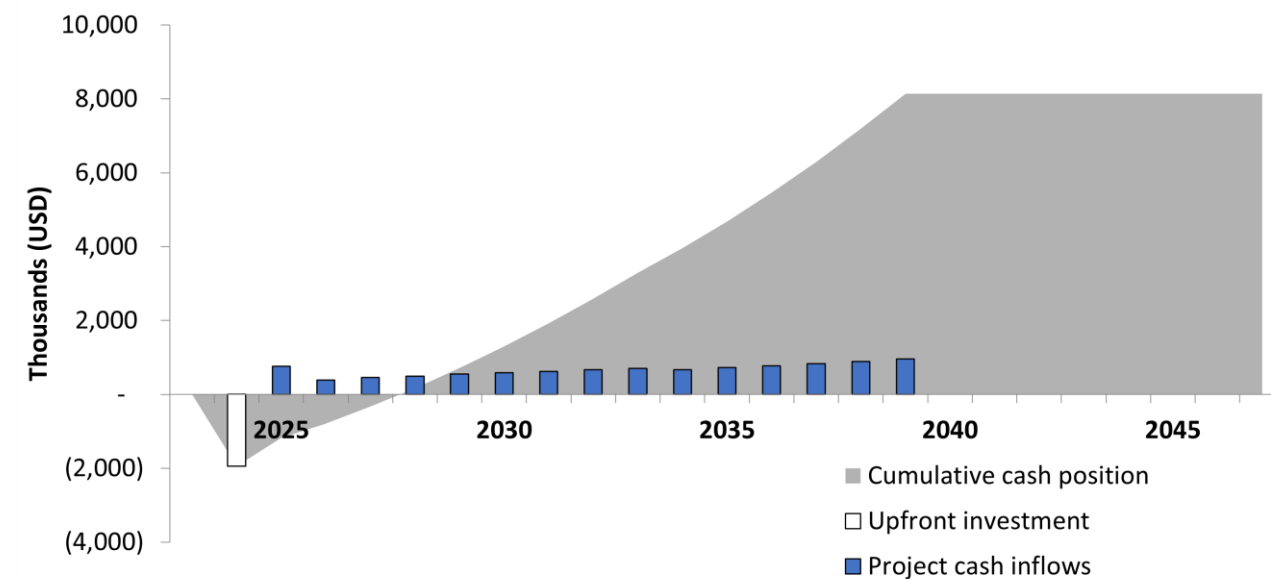
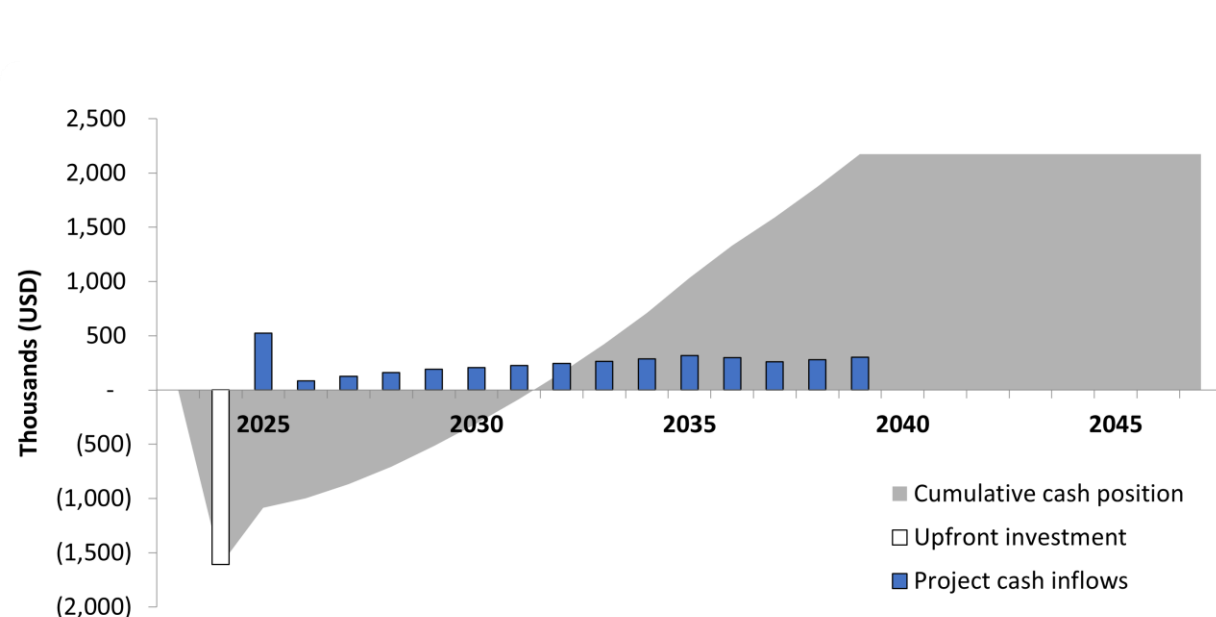
Integrating eCooking into mini-grid planning from the beginning can greatly improve the business case, because much of the system CAPEX is required with or without eCooking.



Loughborough
University



PowerHut, Tanzania solar mini-grid portfolio



Impact of eCooking inclusion on mini-grid business plan (profits & payback period),
(left) model without eCooking **(right)** model with eCooking

Questions for Phase 2

- Will people **use** eCooking appliances enough?
- Will cooking fall in **solar-rich hours** or the evening peak?
- Can **tariffs and DSM** shift behaviour?
- What does real **peak demand/diversity** look like?
- How much does **reliability** determine adoption?

PowerHut, Tanzania – Real EPC deployment

- **347 EPCs deployed** across 8 existing island mini-grids
- EPC households: **~10 → 18 kWh/month**
- **Total monthly mini-grid electricity sales +40%**
(Jan 2025–Mar 2026)
- **Tariff reduced: TZS 1,500/kWh (USD 0.58/kWh)**
- Cooking logs: **0.35 kWh/session, 50%+ cost savings**
- **78%** of logged EPC energy in the daytime window
Midday is the culturally dominant meal
- **Reliability matters:** supply disruptions affected use



Typical island EPC setup. Credit: PowerHut

Soton University, Kenya – Smart innovation

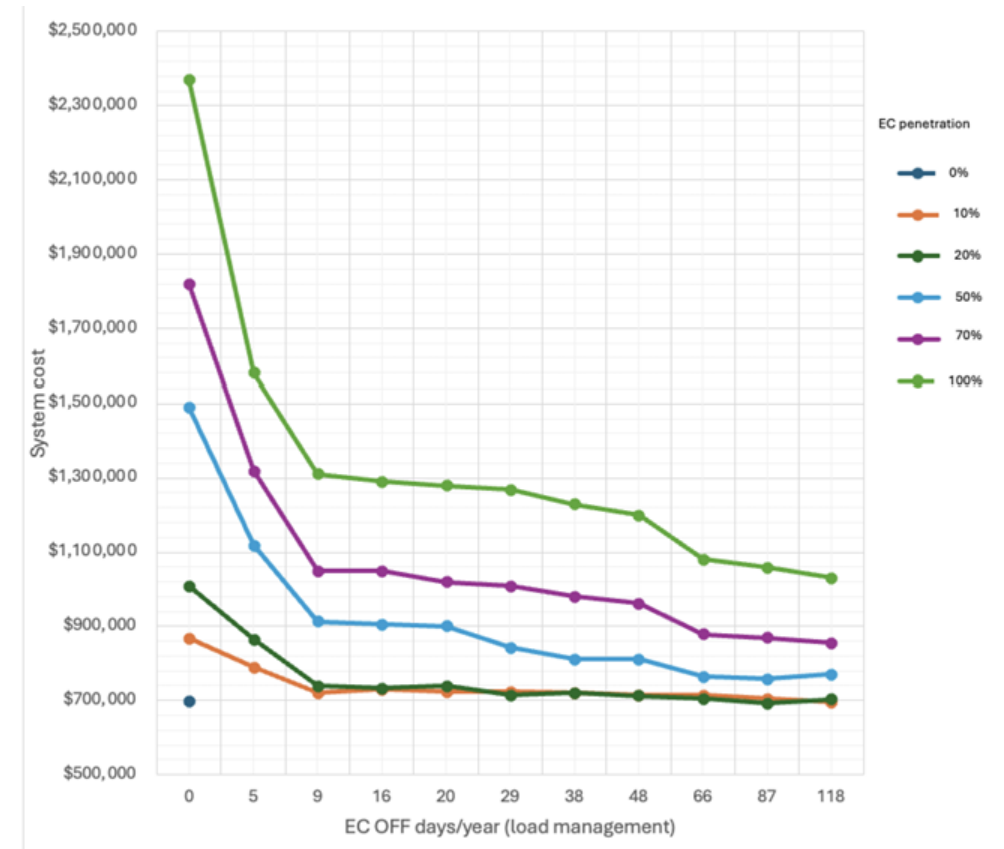


- Small (84 HHs) solar mini-grid upgraded
- 14 eCooking appliances in restaurants
- eCooking usage lower than modelled – droughts, etc
- **Tariff: KES 40/kWh (USD 0.31/kWh)**
- Existing meters could not do true ToU billing
→ smart plugs + **Green Light Hours** + reward units
→ **KES 30/kWh (USD 0.23/kWh)...** 1 for every 3
- **57%** of eCooking energy during Green Light Hours

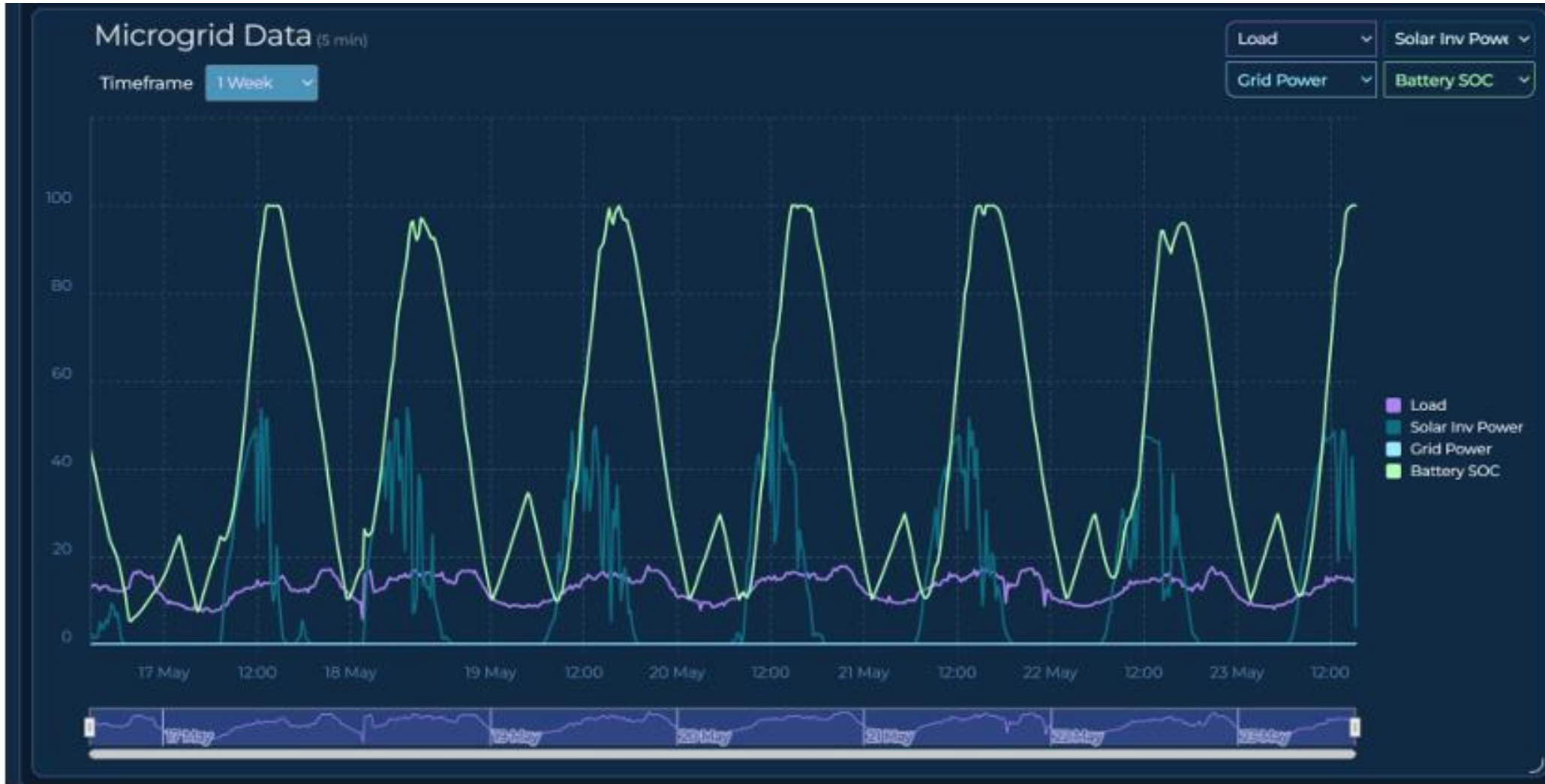
Green Light system. Credit: Soton Uni

Earthspark, Haiti – Advanced models

- Appliances delayed – Advanced modelling for **100% renewable microgrids**
- eCooking curtailed only **9 days/year** while maintaining full reliability for other loads
- Existing systems show daytime solar headroom/clipping
- **20% eCooking adoption → 6% extra CAPEX**
- **Reinforces:** eCooking can be very strong when designed for from the outset
- **Tariff reduced by 10% to USD 0.63/kWh**



eCooking load management. Credit: Earthspark

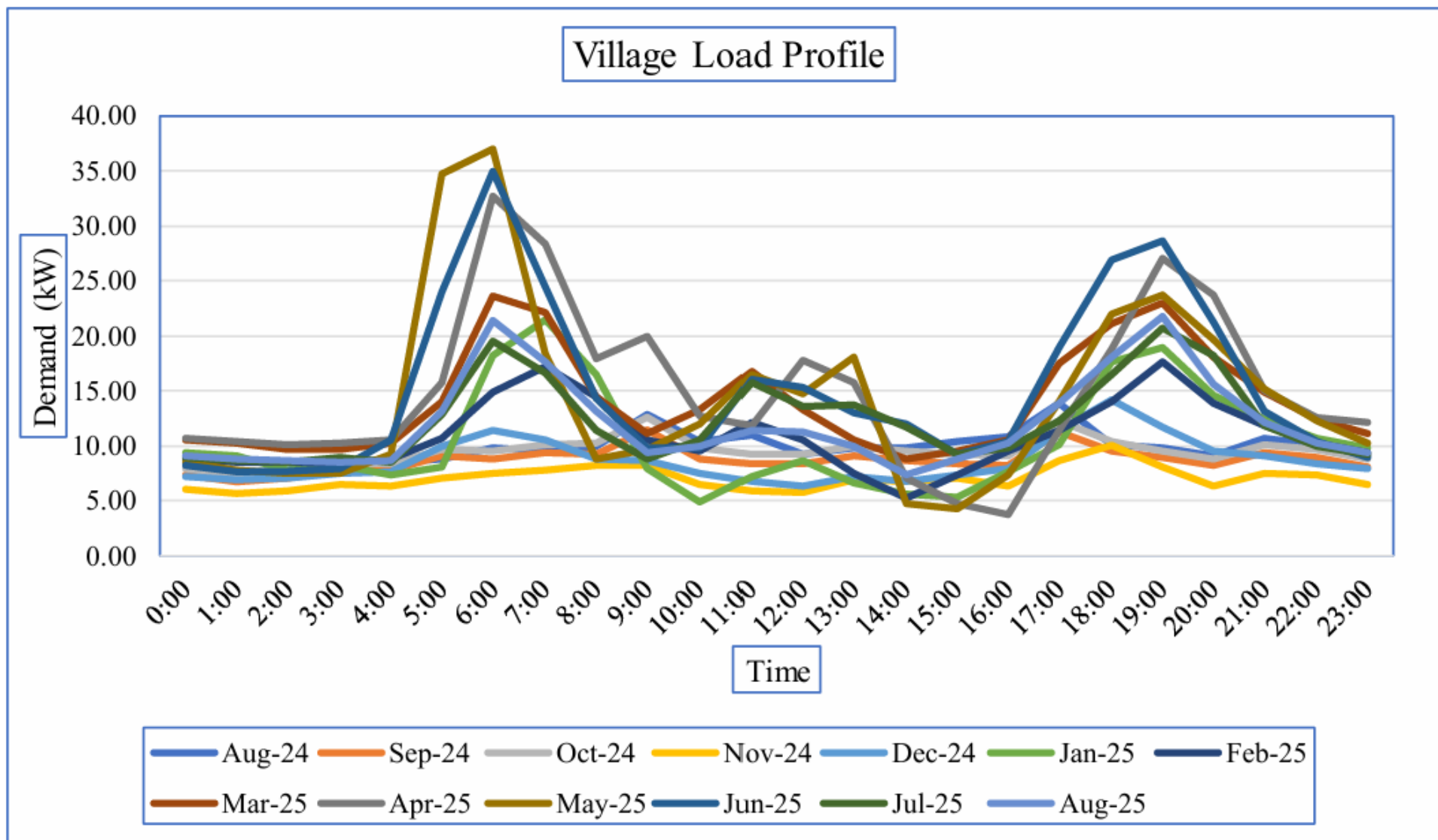


Solar clipping. Credit: Earthspark

NAMHUS, Nepal – Micro hydro, high usage



- **68 kW** community micro-hydro mini-grid, **300 induction cookers**
- Diary sample: **73% events eCooking.... Training, demos, subsidies**
- Wider survey: +20 kWh in households with eCookers
- **Tariff: NPR 100 + 5/kWh (USD 0.65 + 0.033/kWh)**
- **Grid interconnection, but capacity not exceeded**
- Peak load: roughly **10–14 kW pre-eCooking → ~37 kW (200 cookers)**
- **Lesson:** high usage possible, high demand diversity reduces peaks
- [Diversification working paper](#) – factors of 7 and above



Average community load profiles. Credit: NAMHUS

Conclusion

- **Integrate eCooking into planning** where possible
- **Actual sustained use** determines the business case
- **Reliability** is a prerequisite
- **Tariffs and DSM** are impactful — but depend on regulation, meters and cooking culture
- **Overall – potential wins for both operators and customers**