UCL LITE: Lighting up Nepal

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Energy 2 – Group 1

LITE Gearing up for change

Problem Statement

- **Problem**: Lighting within households for the internally displaced population (IDP) of Kathmandu, Nepal.
  ➔ Only 11% of the IDP have access to a reliable source of lighting [1].
  ➔ Increased reliance upon fuel-based technologies
  ➔ Lighting accounts for 18.5% of monthly income [2].
- **Target audience**: 3903 inhabitants (900 households; 2052 Male, 1851 Female) [3] in 11 settlements along the Bagmati River.
- **Project aim**: Set up a network of energy generators to ensure sufficient lighting for the community.
  ➔ Enhancing economic, educational and social activities beyond the daylight hours.
  ➔ Affordable, safe and environmentally friendly.

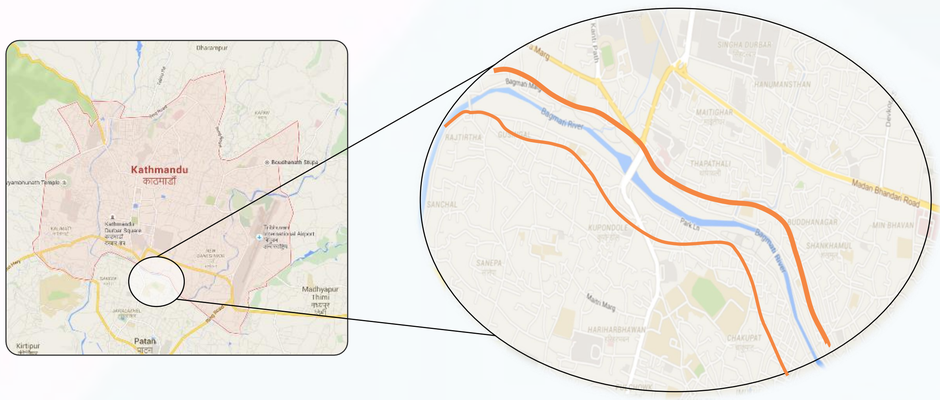


Figure 1: Targeted IDP settlements along the Bagmati River in Kathmandu, Nepal

Stakeholders

Stakeholder	Considerations	Needs
IDP along Bagmati riverbank	Safe, environmentally, sustainable and accessible source for women and children to use.	Lighting sources to carry out economic, social and educational activities.
Ministries of Energy, Water Resources Electricity Authority	Infrastructure. Distributors. Corruption.	Provision of lighting that is acceptable, accessible and readily available.
Investors/ funders – StoreDot, USAID, UNDP	Workforce capability. IDP purchasing power. Investment.	Impact maximization. Cost minimization.

Proposed Concept

Portable Hydroelectric Generator

Technical Information

Generator specs:
- Diameter: 0.5m
- Fixed pitch blade: 22º
- Power coefficient: 0.22
- Power output: 47W at 350 RPM
- Configuration: 3 flat-blades

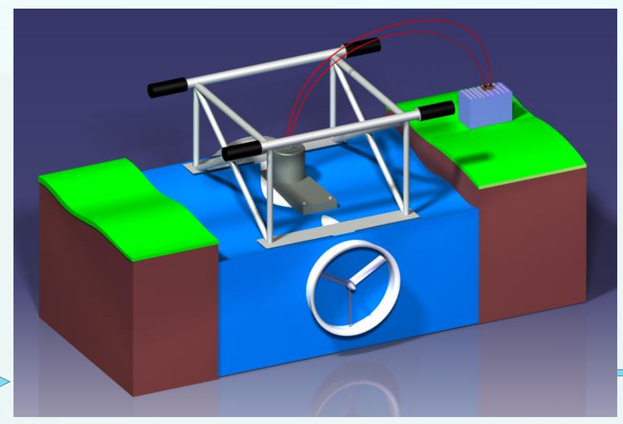
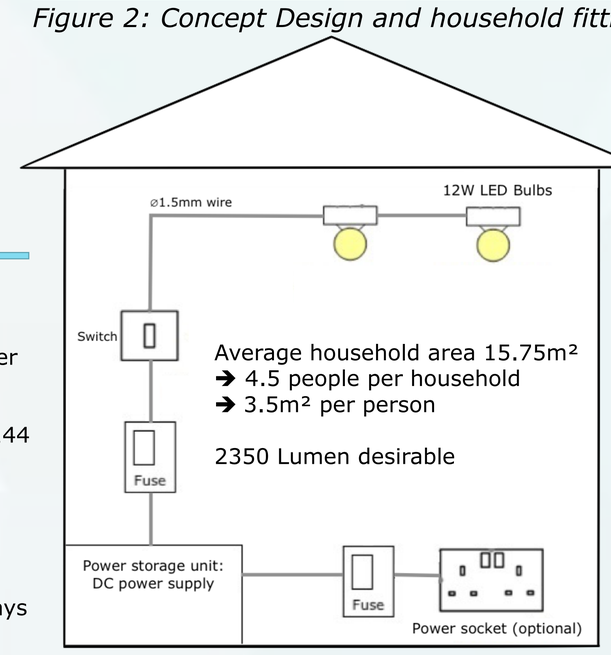


Figure 2: Concept Design and household fitting

Safety:
- Voltage-regulated shunting system
  ➔ Allows power to flow to electrical equipment,
  ➔ Prevents overcharging of the battery
  ➔ Water proof casing

When battery is depleted, it will be removed and docked into the charging station

When battery is fully charged, it will be docked in the battery bay for household lighting usage



Energy usage per household:
- 6 hours of lighting per day
- 2x12W LED bulbs
- Energy required: 0.144 kWh/day

Battery:
- Capacity: 2.5kWh
- Weight: 15kg
- Operating time: 5 days per 2 households

Lifespan:
- 20 years (IDP average time within the settlement is 17 years)

Power socket:
- For charging mobile phones or other uses

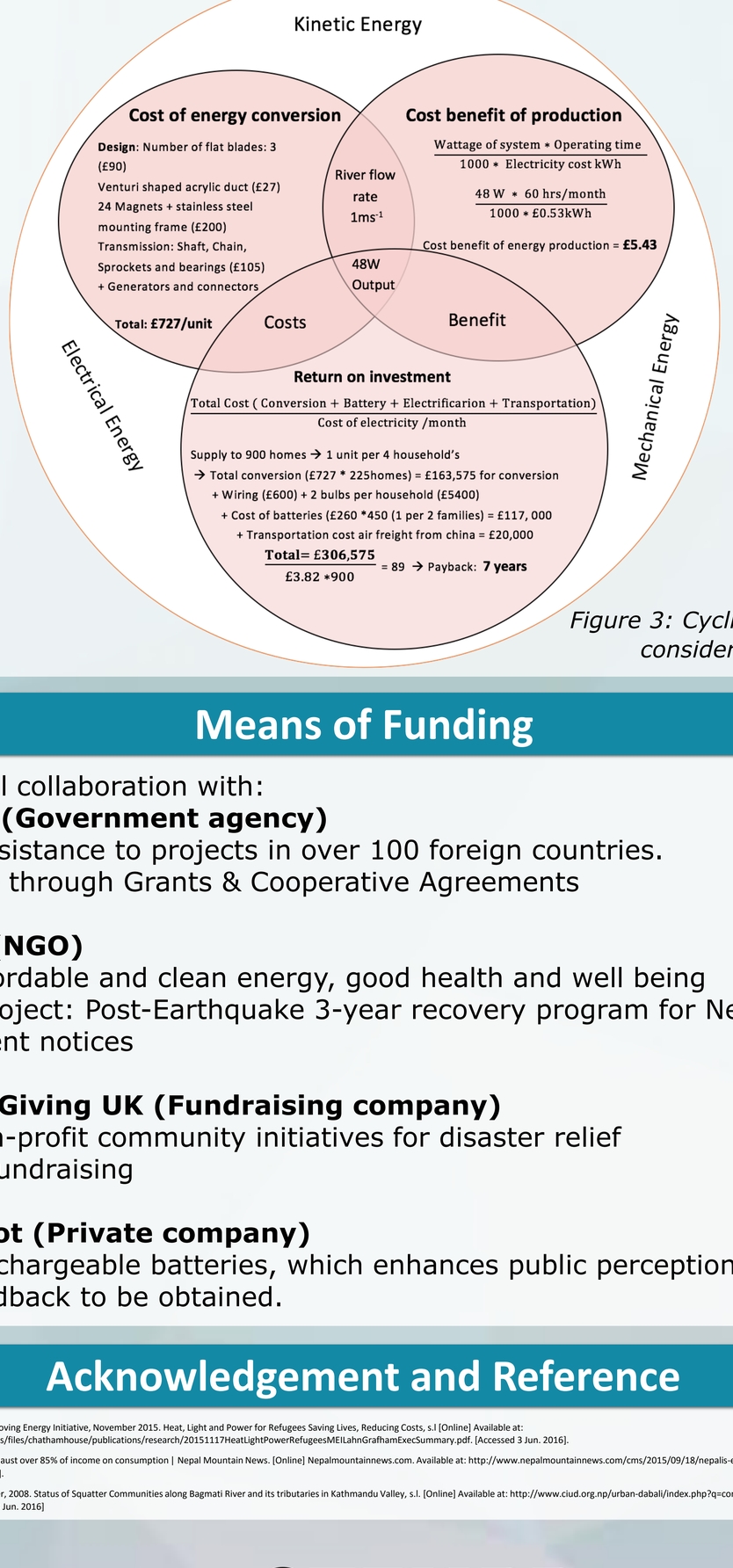


Figure 3: Cyclic economic consideration

Means of Funding

In financial collaboration with:

- **USAID (Government agency)**

Provide assistance to projects in over 100 foreign countries.
Assistance through Grants & Cooperative Agreements

- **UNDP (NGO)**

Goals: affordable and clean energy, good health and well being
Current project: Post-Earthquake 3-year recovery program for Nepal
Procurement notices

- **Global Giving UK (Fundraising company)**

Goals: non-profit community initiatives for disaster relief
Financial fundraising

- **Storedot (Private company)**

Provide rechargeable batteries, which enhances public perception and allows feedback to be obtained.

Acknowledgement and Reference

[1] Chatham House Report for the Moving Energy Initiative, November 2015. Heat, Light and Power for Refugees Saving Lives, Reducing Costs, s.l [Online] Available at: https://www.chathamhouse.org/sites/files/chathamhouse/publications/research/20151117HeatLightPowerRefugeesMEILahnGrafhamExecSummary.pdf. [Accessed 3 Jun. 2016].

[2] Shrestha, H. (2016). Nepalese exhaust over 85% of income on consumption | Nepal Mountain News. [Online] Nepalmountainnews.com. Available at: http://www.nepalmountainnews.com/cms/2015/09/18/nepalis-exhaust-over-85-of-income-on-consumption/ [Accessed 3 Jun. 2016].

[3] Lumanti Support Group for Shelter, 2008. Status of Squatter Communities along Bagmati River and its tributaries in Kathmandu Valley, s.l. [Online] Available at: http://www.ciud.org.np/urban-dabali/index.php?q=content/report-squatter-and-slum-settlements-kathmandu. [Accessed 3 Jun. 2016]

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