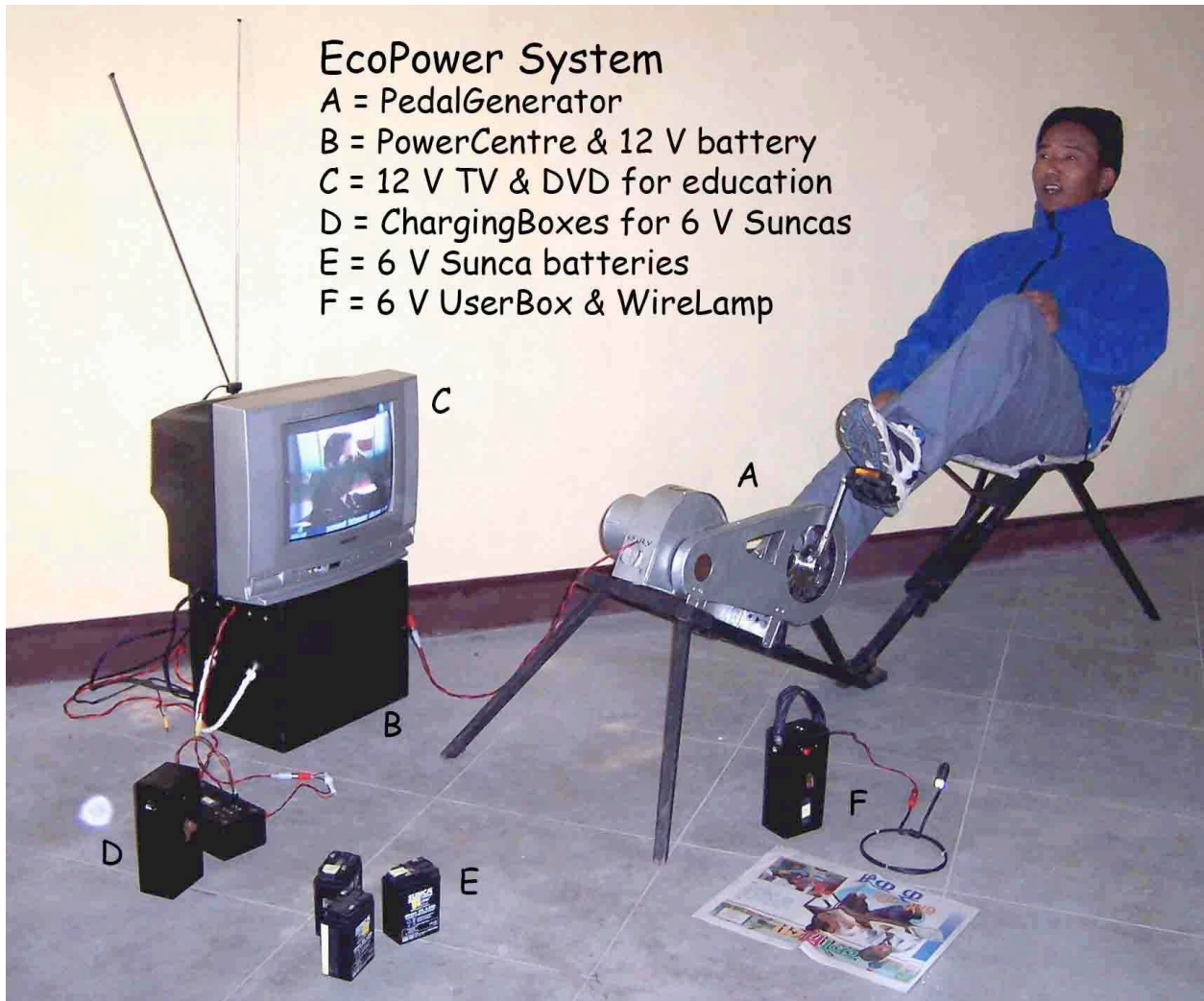


EcoPower from VillageTech Solutions

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0.1 – 120 watt power ~ anywhere, anytime

VillageTech Solutions



Bettering lives through creative and sustainable use of low-cost technologies

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Summary

Background – David and Haydi Sowerwine, a husband and wife team from the Bay Area, lived in Nepal for fourteen years where they worked to better lives through creative and sustainable use of low-cost technologies.

Their approach relies on knowledge of local needs and resources, skilled local craftsmen, volunteer engineers and contributions from its founders and donors.

David's team designed the WireBridge, a carriage system that moves people across fast-flowing rivers. This won the 2003 Accenture Economic Development TechAward. ¹

With David's guidance the team developed a human pedal-powered generator and energy distribution system which earned a 2006 World Bank Development Marketplace grant. ²

The PedalGenerator was designed with "real-world" considerations in mind, to serve the broadest set of potential users in developing countries. Key design attributes:

- robust 70 watt performance for 0.1-120 watt requirements
- low initial investment; labor earnings stay in the community
- minimum maintenance and easy portability
- comfortable, efficient, easy and intuitive to operate
- novel features to maximize reliability and productivity



Opportunity – The developing world's people need power for low 0.1-120 watt devices to obtain high value services: LED home lighting; the 'One Laptop per Child' (OLPC) computer for individual learning; A/V-based group education; cell phone communication, water purification, power tools...

Entrepreneurs, NGOs, donor and government agencies, schools, health facilities, electric agencies – want to make these benefits available, but all devices need power. Conventional renewable sources can be expensive and limited by weather; grid power is often unreliable.

Where there are needs, there is human energy: one person can generate 50-70 watts. A generator will run a classroom with 30 OLPC computers or a TV/DVD set, or light 200 homes, charge hundreds of cell phones or some mix of these services. The distribution system repackages energy for low-wattage home use while protecting the batteries...



Competition – Our research suggests that none of the six other human generators we have identified are at the same intersection of benefits, cost and durability.

VillageTech Solutions (VTS) – Created to scale these technologies, VTS will coordinate the program to 'empower' the developing world.

People – Back in the Bay Area, David and Haydi coordinate technical and financial support. A Board, Advisors and managers of VTS are being recruited.

Progress – Valuable field experience is coming from field trials with 17 generators, hundreds of home lighting systems, and a school-based A/V center in Nepal, Myanmar, and Haiti. We expect local production in Nepal in early 2008, and in China by early 2009.

Potential – Hundreds of thousands of classrooms and villages. Millions of beneficiaries.

¹ <http://www.techawards.org/2003Videos/ecosystems.mov>

² <http://web.worldbank.org/WBSITE/EXTERNAL/OPPORTUNITIES/GRANTS/DEVMARKETPLACE/0,,contentMDK:20900942~pagePK:180691~piPK:174492~theSitePK:205098,00.html>

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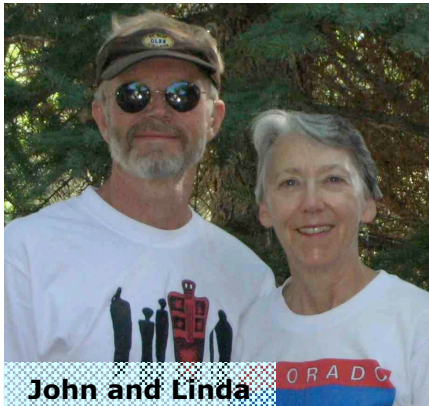
social entrepreneurship for solutions

In his career David sought to create local employment and opportunity through his employers, Esso Eastern in Asia and Castle and Cooke in Latin America.

David grasped the opportunity to develop new energy and transport products for Nepal's market by forming a small company to create market-based solutions.



David and Haydi



John and Linda

In 1996 the Nepal government gave EcoSystems a 'permit' to work on 'energy and transport'. Bridge #1 was built in December, 1998.

Our approach relies on experience from 14 years in Nepal, understanding local needs and resources, engaging skilled local craftsmen and volunteers, and funding from the founders, prizes, and product sales (often donations).

John Mahan, electrical engineering professor at Colorado State, volunteered to be the EcoPower technology program manager when he retired in 2006.

The Nepal team and volunteers have field tested the EcoPower technology using funds from the World Bank's Development Marketplace, and the results are being integrated into the new design.



EcoPower team 2004/5



EcoPower team 2006/7



2007/8
Volunteers
←→



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raising living standards means overcoming obstacles

A problem: without electricity there are many missed opportunities

- wick lamps (tukis) give light – but burn kerosene, create air pollution and CO₂
- those who cannot afford kerosene get light from a fuel-hungry open hearth
- recharging cell phones is difficult – a long walk to the nearest charging point
- radios consume batteries – that are discarded haphazardly
- schools can't tap the world of A/V-assisted education – a huge opportunity is lost
- telecommunication is impractical



The tuki. It offers light – but also lung damage and fire



The infamous open hearth



Schools are isolated



A huge unsatisfied appetite for education!



Half the population is under 17 years

EcoPower from VillageTech Solutions

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0.1 – 120 watt power ~ anywhere, anytime

An answer: we created the EcoPower low wattage system 50-70 W PedalGenerator+12 V Storage+ 6 V Distribution

- LED lights replace kerosene and enable shift from hearth to closed cookstoves



Learning to pedal



First light from medical lamp with UserBox

- Users can charge cell phones and run radios from the UserBox power source



Studying their new UserBox



UserBoxes for field trial

- Power for A/V education and telecommunication can be available anywhere, anytime



First time pedaler



First UserBox



Home 'candelabra'

EcoPower from VillageTech Solutions

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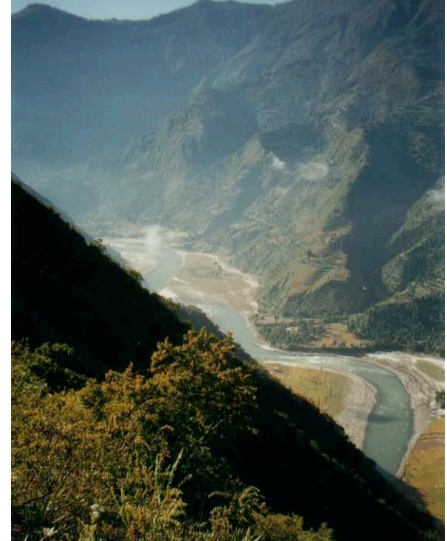
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raising living standards means overcoming obstacles

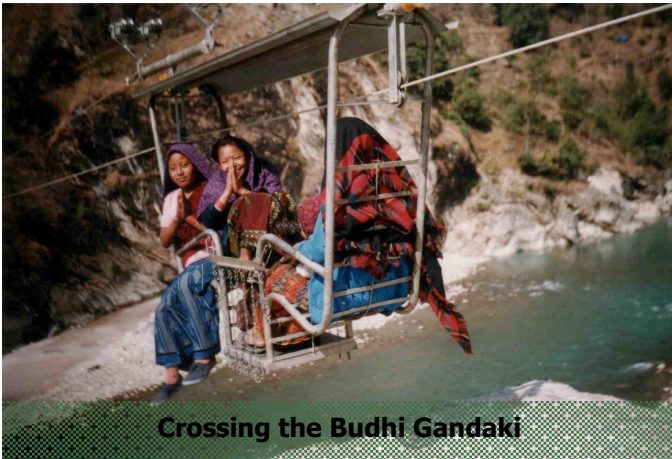
A problem: In a rugged countryside, rivers restrict access to education, health care & markets



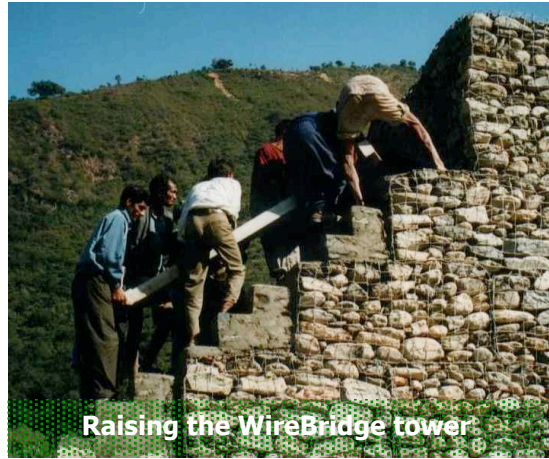
Girls risk fingers to get to school



An answer: 32 WireBridges moved 3,000,000 passengers w/o injury



Crossing the Budhi Gandaki



Raising the WireBridge tower



Corrugated roofing transport



Old 'tween' and new WireBridge