Global Green Healthy Hospital (GGHH)

Asia Conference 2015

Adoption of Renewable Energy:

Solar at small health care facilities in Nepal

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GGHH Partners in Nepal

Health Care Foundation Nepal

- **Established in 1994**
- **Non-government and not for profit organization**
- **Mandate to work on**
  - ***Health Care***
  - ***Environmental Health***
  - ***Disaster Medicine***

Shanti Med Nepal-Switzerland

- Swiss INGO working in Nepal since 2006.
- Provides medical help to the poorest needy people of Nepal
- Promoting solution for environmental health issues
- Collaborating with HECAF since 2010
- Member of GGHH

Shanti Med Nepal and HECAF jointly working to promote GGHH initiatives in Nepal

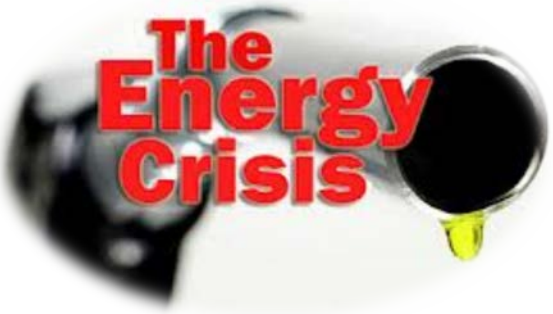
Why to promote GGHH Initiative in Nepal?

Preserve our Nature

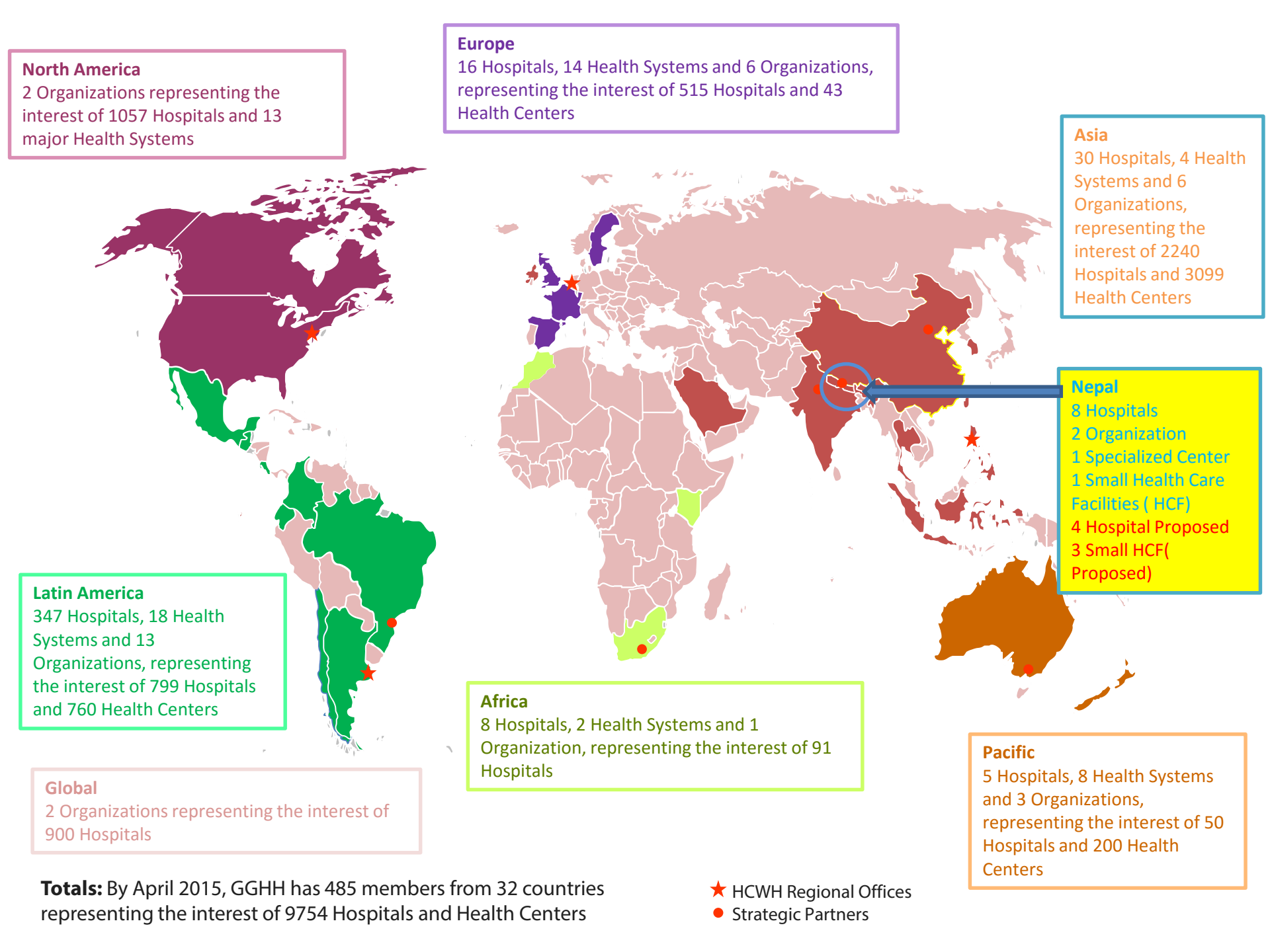
Clean our environment

Solve our waste problem

Solve our water crisis



Solve our energy crisis



Totals: By April 2015, GGHH has 485 members from 32 countries representing the interest of 9754 Hospitals and Health Centers

GGHH Members from Nepal (Hospitals)

National Kidney Centre

Western Regional Hospital, Pokhara

Bayalpata Hospital

Bir Hospital

Norvic International Hospital

Kathmandu Model Hospital

Paropakar Maternity and Women's Hospital

Kirtipur Hospital

Proposed GGHH Members from Nepal (Hospitals)

Tilganga Institute of Opthalmology

Grande City Hospital

Kathmandu Medical College and Teaching Hospital

T.U. Teaching Hospital

Proposed GGHH Members (Small Health Care Facilities)

Chainpur Health Post

Pithuwa Health Post

Ratnanagar Hospital

HECAF promoting GGHH goals

- Goal 1:Leadership
  - Advocacy on GGHH Agenda- for safe and sustainable waste management and other goals relevant to GGHH with health care facilities operating inside and outside Kathmandu Valley, with government agencies within Nepal and at international scientific and technical meetings.
- Goal 2: Chemicals

  Chemical and Mercury Free Campaign
- Goal 3: Waste
  - promoting non-burn waste treatment system and sending waste for recycling as much as possible.
- Goal 4: Energy
  - Advocating health care facilities to adopt alternative source of energy like Solar, Bio digester to promote green building.
  - HECAF has already been successful to generate biogas as a renewable fuel form the bio-digester.

Global Green and Healthy Hospitals Agendas Goals

Goals promoted by HECAF

Leadership

Prioritize environmental health as a strategic imperative

Chemicals

Substitute harmful chemicals with safer alternatives

Waste

Reduce, treat and safely dispose of healthcare waste

Energy

Implement energy efficiency and clean, renewable energy generation.

Water

Reduce hospital water consumption and supply potable water

Transportation

Improve transportation strategies for patients and staff

Food

Purchase and serve sustainably grown, healthy food

Pharmaceuticals

Prescribe appropriately, safely manage and properly dispose of pharmaceuticals

Buildings

Support green and healthy hospital design and construction

Purchasing

Buy safer and more sustainable products and materials

Background: Situation of Energy in Nepal

Energy: Waste to energy (Bio-digestion) initiatives in hospitals of Nepal

Waste to Energy (Bio-digestion) at Bir Hospital

Inlet: food and pathological waste

Outlet: Gas

Future target: production of electricity from Bio-gas

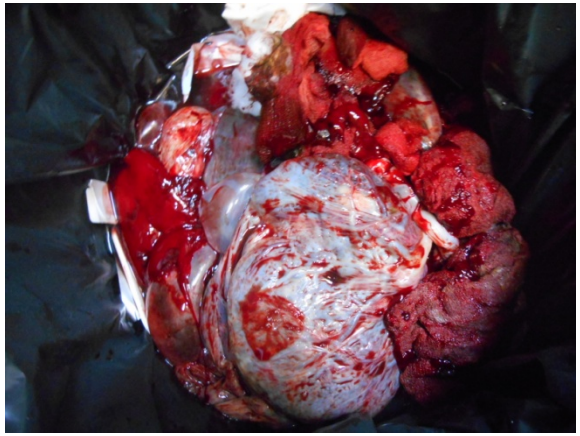
Waste to Energy (Bio-digestion) at Kirtipur Hospital

Inlet: food, pathological waste & toilet drainage

Dome of Biogas plant

Use of gas in kitchen

Waste to Energy (Bio-digestion) at Chainpur Health Post

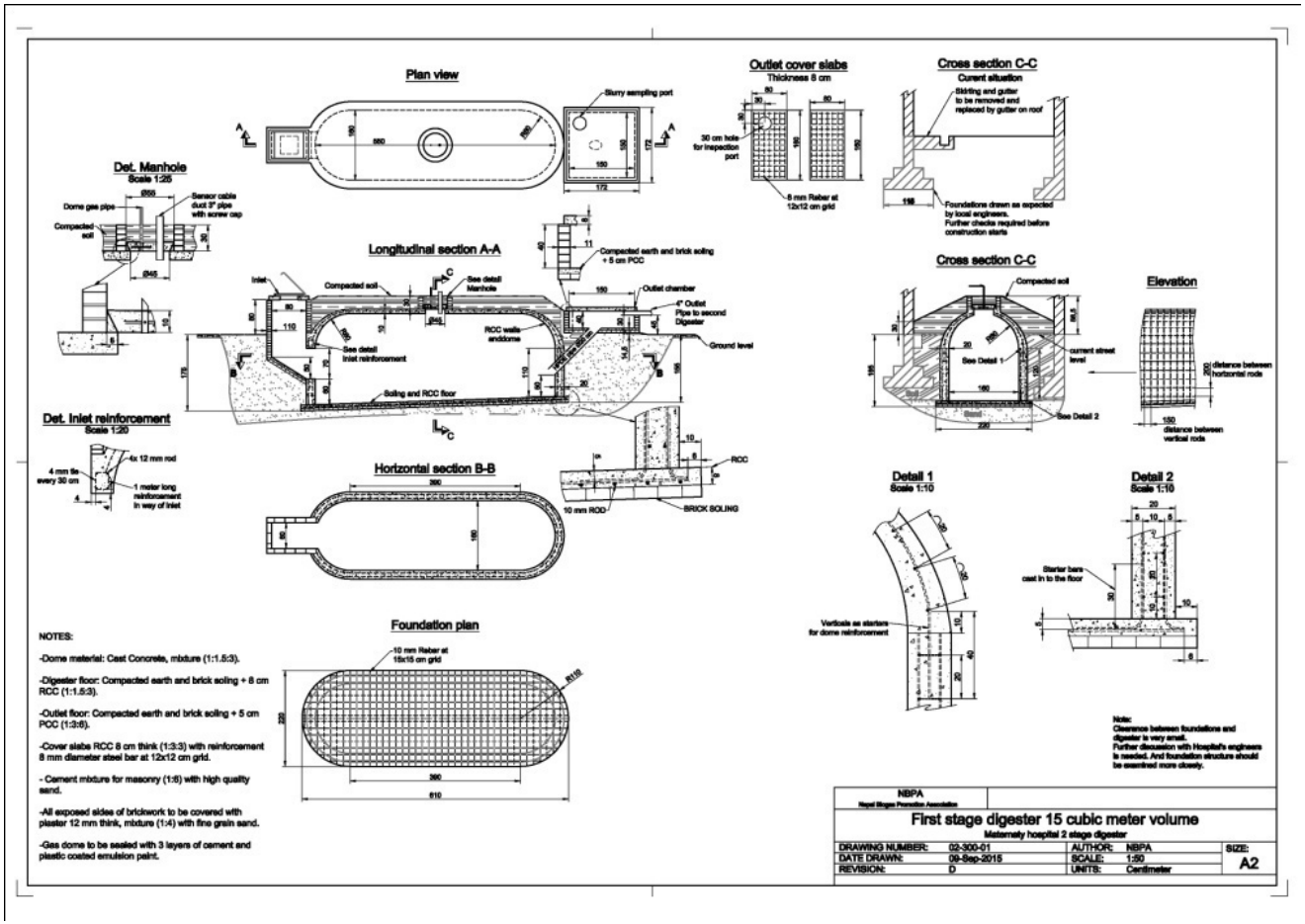


Pathological waste/ Placenta

Biogas plant

Toilet drainage is also connect with biogas plant

Placenta Waste to Energy(Bio-digestion)
Upcoming projects

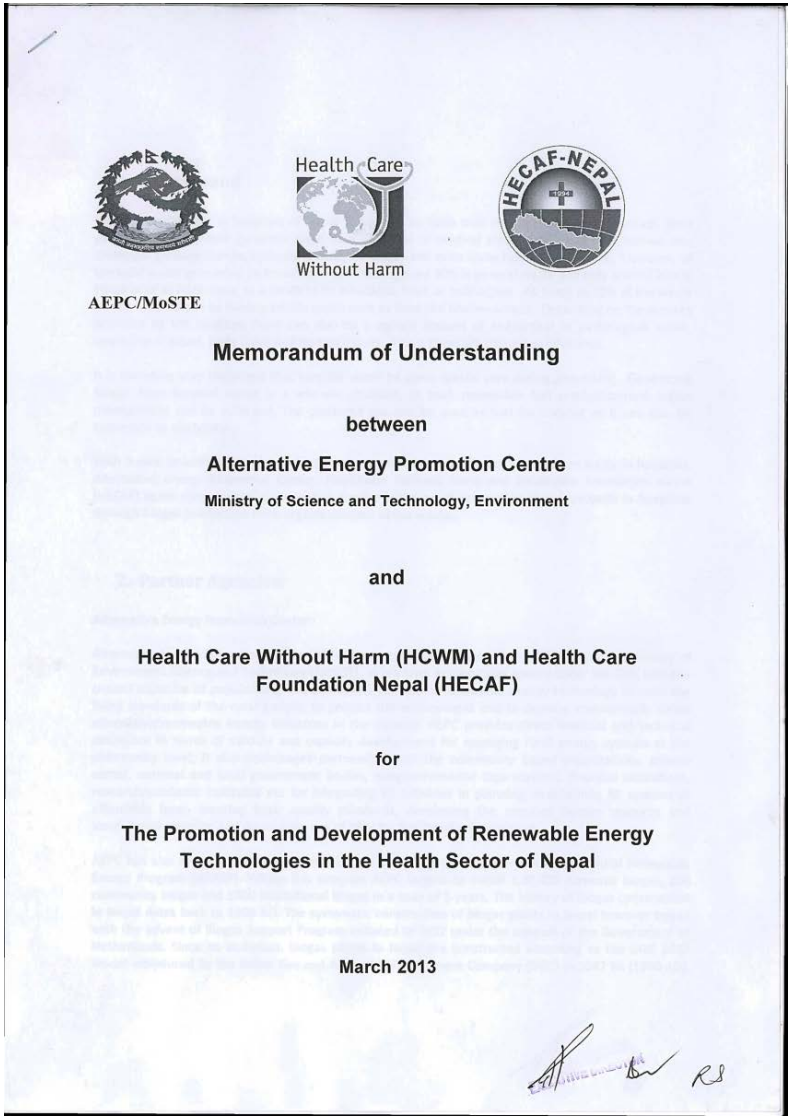


Paropakar Maternity and Women's Hospital
Grandy City Hospital
Kathmandu Medical College

Energy: Solar initiatives in hospitals of Nepal

Energy: Partnership with Alternative Energy Promotion Center

- Alternative Energy Promotion Centre (AEPC)
  - Government's Focal Institution for promotion of renewable energy
  - HECAF & HCWH has signed MoU with AEPC for promotion of renewable energy in healthcare institutions
  - AEPC has also shown interest to be the member of GGHH



AEPC/MoSTE

Health Care Without Harm

HECAF-NEPAL

Memorandum of Understanding

between

Alternative Energy Promotion Centre

Ministry of Science and Technology, Environment

and

Health Care Without Harm (HCWM) and Health Care Foundation Nepal (HECAF)

for

The Promotion and Development of Renewable Energy Technologies in the Health Sector of Nepal

March 2013

Energy efficiency – some facts

- Hospitals use about twice as much energy per square meter as traditional offices
  - *with associated greenhouse gas emissions.*
- Reliable power supply is essential
  - *Lighting, ventilation, therapeutic services*
- Electricity is a primary need
  - *thermal energy needed in some settings.*
- Health sector needs expertise
  - *in innovative technologies and energy systems*

Source: WHO

Potential of Solar power in Nepal

- Average global solar radiation: 3.6-6.2kWh/m²
- Sun shines: 300 days a year
- No of sunshine hours: 2100 hours per year
- Average insolation intensity: 4.7 kWh/m²/day

Source:WECS (2010). Energy sector Synopsys Report, Nepal, Energy Sector Synopsis Report, Nepal

Solar Energy: Bir Hospital

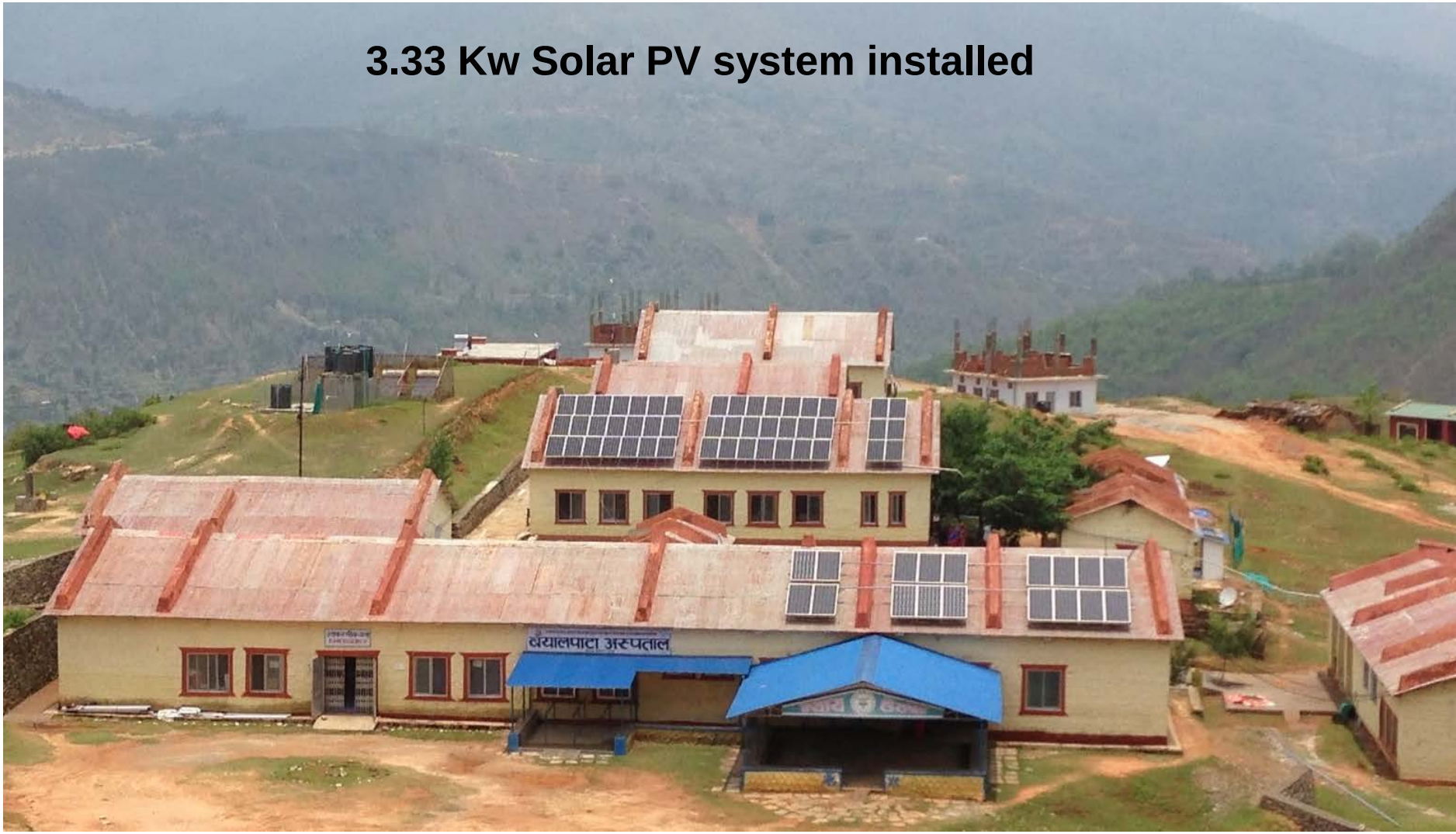


- **248 no** of solar panels installed by Chinese company with the support from World Bank
- Total PV array: **60 KVA**
- Energy to be used in units like Emergency, ICU and OT

Energy: Tilganga Institute of Ophthalmology

- **156 nos** of Solar Panel from Sunpower Inc USA
- Total PV Array (Photo Voltiac): **38.22 Kwp**
- **Total battery capacity is 11475 Ah/48 V**

Energy: Solar Energy, Bayalpata Hospital



Government of Nepal's Solar Subsidy Program for Health Care Institutions

- Government of Nepal (GoN) in its Renewable Energy Subsidy Policy under institutional solar PV system (ISPS) has clearly set provision for subsidy 75% of total investment, maximum up to NRs 10 lakh(US$ 10000) for health post and health centers of non electrified areas.
- Till date, 19 the total number of such ISPS systems installed with GoN subsidy for health facilities is 19.
- Feasibility studies have been conducted for 61 health institutions and they are on the process of installation.
- Under urban solar subsidy program, GoN has subsidized urban ISPS systems for 6 hospitals.

Source: Subsidy Policy for Renewable Energy 2069 BS

Use of Solar Power in Small Health Care Facilities in Nepal

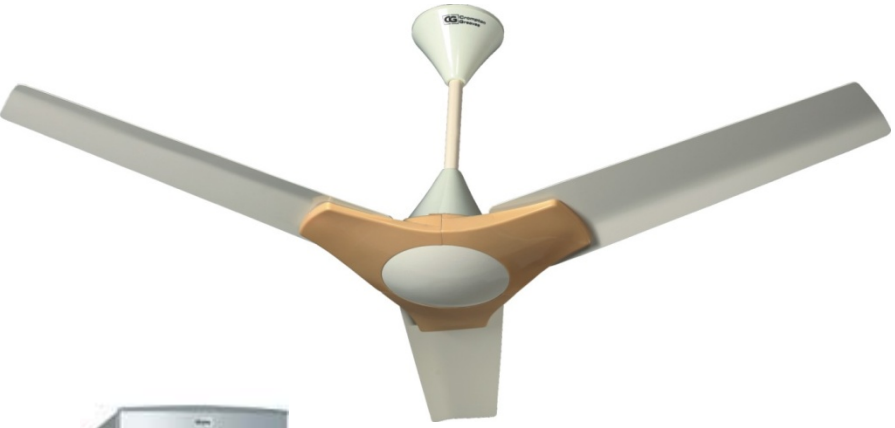
Chainpur Health Post

- Total number of panels: 4
- Total number of batteries: 16
- Capacity of Solar Panel: 210 W
- Capacity of Battery: 100 AH
- Capacity of solar UPS: 5KVA
- Total investment cost: 5460 USD
- 88% of total cost was donated by Shanti Med Nepal
- 12% of total cost was covered by Health Post

Pithuwa Health Post

- Total number of panels: 4
- Total number of batteries: 8
- Capacity of solar panels: 210 w
- Capacity of batteries: 150AH
- Capacity of solar UPS: 3.5 KVA
- Total investment cost: 7289 USD
- 88% of total cost was donated by Shanti Med Nepal
- 12% of total cost was covered by Health Post

Run Appliances from Solar Power



- Used as a back up during power cut
- Runs appliances
  - Refrigerator: 1
  - Autoclave: 1
  - Fan:4
  - Lighting: 4

Solar: Ratnanagar Hospital

15 bedded hospital with general services, dialysis facility and orthopedic center

- Total panels: 108
- Capacity: 21 KW
- Average Daily Electricity Production: 111 kWH/unit

Solar: Ratnanagar Hospital

Charge controllers and Inverters

72 batteries of 10000 AH/2V

Total investment: 89500 USD
80% of total investment from Shanti Med Nepal- Switzerland
20% of total investment was subsidized by Nepal Government

Appliances powered by solar

Dialysis facility run by solar system

6 Dialysis machines

Reverse Osmosis system

Key benefits

- Improved service delivery
  - Delivery during night time is convenient due to adequate light
  - Service delivery during day is improved during hot season due to operation of fan
  - Regular dialysis service
  - Regular laboratory service
- Staff are motivated to work

Key benefits

- Provides own clean power source that helps reduce global warming (reduce CO2 emission)
- Reduces electricity bills, since Sunlight is free
- Increases the value of your property
- Extremely low maintenance, with a long functional lifetime of 25 years or more
- Silent in operation and visually unobtrusive
- Increases your awareness of electricity use and encourages more energy efficient behavior

Thank you

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