



**FIJI NATIONAL
UNIVERSITY**

CAPACITY BUILDING IN RE & EE IN FIJI

*Presentation made during the GREEN PRENEURS Week
On Entrepreneurship in Renewable Energy (RE) & Energy Efficiency
(EE) facilitated by SPC PCREEE)*

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Outline of presentation

- I. Introduction:
 - FNU role as a learning institution
 - Mandates /strategic plan supportive the RE agenda
- II. Renewable Energy & EE Capacity Building Conceptual framework
- III. How to advance RE capacity building programs (individual, organization, national)levels
 - Programs/initiatives
 - Approaches
- IV. What are the RE capacity building initiatives
- V. Insights

The Fiji National University

Role:

- Being the premier university in Fiji, FNU will endeavor to serve as a regional hub for higher education and Technical Vocational Education and Training (TVET) in the Pacific.
- FNU will produce students to be confident as people in Fiji, the Pacific and the world and create national and regional economic, social and community sustainability through the effective development of nations, enterprise and communities.
- Graduates must be able to solve problems and provide direction for development at their own workplaces, and in local, national, global levels, and in society generally.
- (taken from the FNU strategic plan 2020)

CHALLENGES

THROUGHPUT

OUTPUTS

OUTCOME

- Limited Access to Affordable, reliant modern energy services to all
- Reduce dependence on imported fossil fuels as a source of energy for electricity
- Expand current energy efficient technologies and practices
- Need for sustainability of current rural electrification schemes
- Impacts of climate change

Renewable Energy & EE capacity Building



Renewable Energy & EE Capacity Building Conceptual Framework

PCB/EE 20/9/2018

- Access to affordable and reliable modern energy services
- Sustained system for energy production, procurement, transportation distribution and end use
- Increased efficiency of energy use, through use of sustainable energy
- Reduced financial burden and insecurity of energy inputs

Integrated & Sustainable Energy Development Program

Economic Sustained, Inclusive, and equitable Affordable, accessible, available

ENVIRONMENT
resilient ecosystems
high biodiversity,
clean energy

SOCIAL
People- centred,
gender sensitive
Good
governance and
institutions

HOW TO ADVANCE RE CAPACITY BUILDING PROGRAMS (INDIVIDUAL, ORGANIZATION, NATIONAL LEVELS)

- INDIVIDUAL LEVEL

- Approaches

- Undertake a capacity assessment to identify training gaps, needs assessment i.e. survey, questionnaire FGD, experts consultation,
- Implement capacity building based on assessment to include technical, and vocational modalities

□ Develop human resource development program

such as :

- Visiting expert program –this is open to institutions needing experts from another institutions which possesses the expertise;**
- Faculty immersion for Research and Development-this program is open to faculty who wish to gain experience by engaging in a research activity under a recognized organization**
- Trainings in research skills and soft skills i.e. proposal writing, project management, communication, mentoring modalities**

☐ Research & Industrial attachments -this is open to post grad students, researchers and project staff in the science & engineering fields who need to conduct their research in a host institution including foreign universities and research institutions to avail of the host's institutions and facilities and attachments to industries for hands on exposures / practical's.

☐ Attendance in conference, seminars, technical fora

☐ Support for conduct of seminars, conferences and trainings

- Graduate & Research Fellowships / scholarships
- Short term /tailor-made courses
- Networking and collaboration

At Organizational Level represented by academic institution

- Strong partnership mechanism with specific organizations with common areas of interests, development partners , financial institutions, other universities, private organizations , industries , i.e MoIT, Min of Education , SPC, etc.
- Improved coordination within colleges, between departments
- Improvement & Strengthening of support workshops, and research facilities
- Create a critical mass of SE expertise through creation of experts pool
- Networking with partners, Government, NGO's and institutes internal and external
 - Data Analysis
 - Pooling of resources

National Level

- Partnership engagements with government, non government organizations, private sectors and civil societies in the area of sustainable energy.
- Policy advocacy, analysis, evaluation and governance
- Infrastructure and facilities, ICT

Current initiatives

Long Term : RE programs

1. Certificate IV- CBT @NTPC

- Competency Based training for service personnel
- Does not articulate to a higher level programme

2. Diploma in Renewable & Sustainable Engineering

- Complete Diploma Program- 3 year duration including 6 months attachment

Progressive training

RENEWABLE ENGINEERING
TRAINING

Bachelor of Engineering (R E)

Diploma in Renewable & Sustainable Engineering

CERT IV Renewable Energy

CERT III Renewable Energy

ENGINEERING CAREER PATH

B.E DEGREE

ENGINEERS

FSFE PASS 280+

ADV. DIPLOMA

TECHNOLOGISTS

DIPLOMA GRADUATE

DIPLOMA

TECHNICIANS

Form 6 200+/FSLCE
Certificate IV graduates

CERTIFICATE IV

TRADESMAN

Form 6 PASS

CERTIFICATE III

TRADE ASSISTANTS

FJC, F5 PASS

Current initiatives

- Partnership and Collaboration Relationships

Memorandum Of Understanding between MoIT and FNU on Renewable Energy

- Solar
- Biomass
- Biogas
- Hydro
- Wind
- Energy Audit
- Energy Policy

Current initiatives

- Research & Development

- ❖ Compact Biogas Plant

- ❖ Solar Panels

- ❖ Feasibility studies on Pico Hydro Power Plant

- ❖ Feasibility Study on PV Base for Ba Campus

- ❖ Small Scale Biomass Power Plant

- ❖ Pilot Study of Compact Biogas Plant at Secondary Schools

Consultancy Services

- **Data Analysis for Wind Energy in partnership with DoE**
- **Installation & Commissioning of Solar Panel in Vabea District School Kadavu**
- **Impact Assessment Studies of RE technologies (i.e.BIOGAS)**

Consultancy Services

- EU-PacTVET Project, ...to enhance and/or create P-ACPs' regional and national capacity and technical expertise to respond to climate change adaptation and sustainable energy challenges
- FNU staff Mr. Viliame Sakiti contracted by the EU PacTVET project to developed Certificate I-IV programs in Climate Change Adaptation and Sustainable Energy.
- FNU and other Tertiary institutions in Fiji are earmarked and Planned to be a network Hub to centralize and offer these programs.

Consultancy Services

Sustainable Energy programs include:

- Renewable Energy, Energy Efficiency, Biogas and Biomass, Wind, Hydro, Traditional/Hybrid Sea Transport, Traditional/Hybrid Sustainable Construction.

Climate change Adaptation program include:

- Disaster Risk Management, Project Management, Water Security, Ecosystem Based Adaptation, Food Security, Climate Change Mitigation, Environmental Management

Future plans

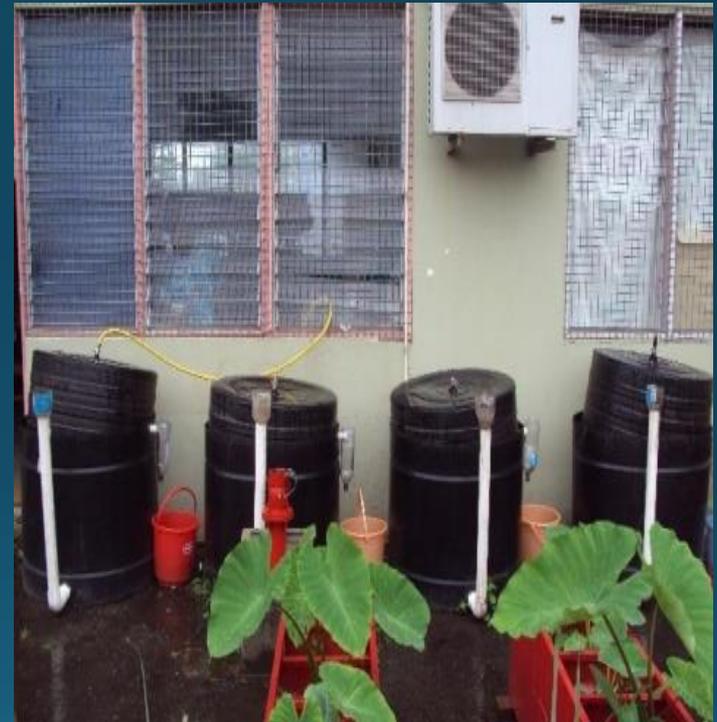
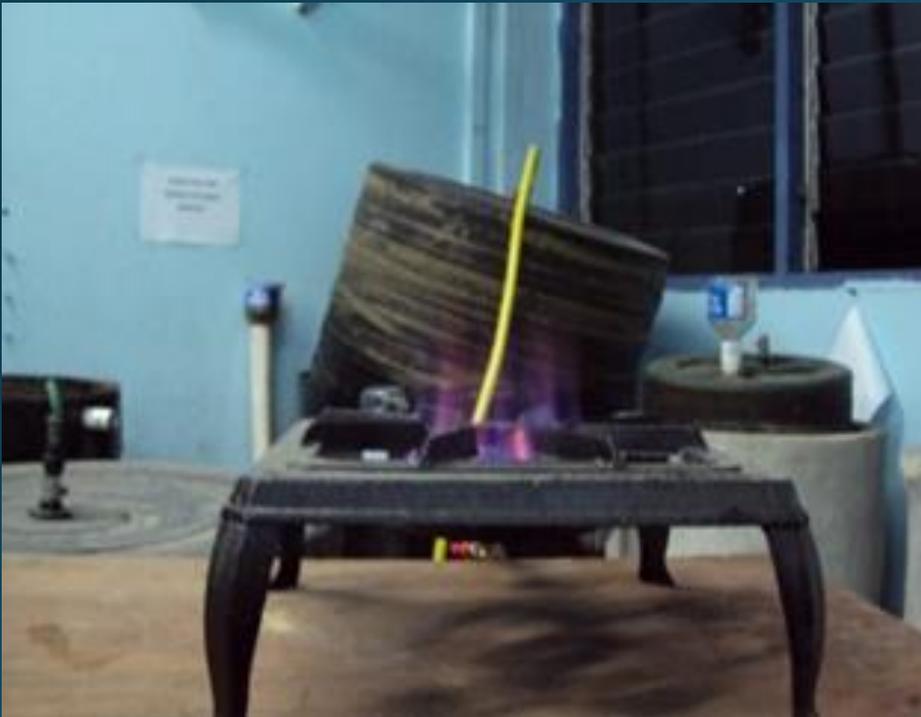
- 1. Development of short term training modules on the following areas:**
 - a. Project design , planning & management
 - b. Preparing specifications
 - c. Installation services
 - d. Maintenance services i.e trouble shooting & maintenance procedures
 - e. Markets and Financing
 - f. Business/Entrepreneurial Skills
- 2. Development of Sustainable Energy Business Incubators**
 - **Grow & nurture companies operating within the energy sector and other industries through provision of business support, facilitation of markets, access to finance, technology transfer and partnerships**

3. Renewable energy Consortium

4. Research and Development (R&D)

5. Form professional associations/collaborations with regional and international organizations like the Pacific Power Association, PCREEE, SPC and IRENA.

Compact Biogas Plant (CBP) Samabula Campus





Using methane gas in well ventilated area



Slurry from digester as liquid fertilizer



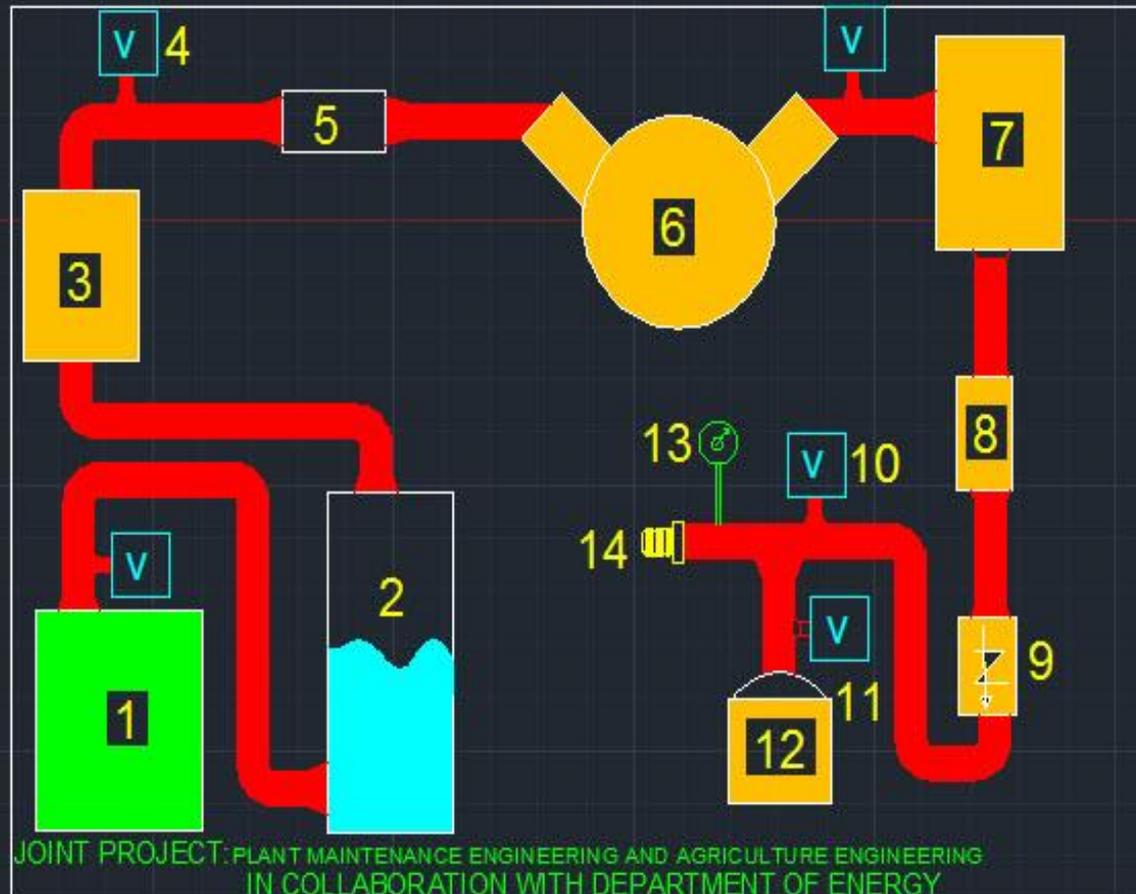


Healthy vegetables watered with slurry (liquid fertilizer from biogas)

Biogas Bottling Project

SCHOOL OF MECHANICAL ENGINEERING

BIOGAS BOTTLING



JOINT PROJECT: PLANT MAINTENANCE ENGINEERING AND AGRICULTURE ENGINEERING
IN COLLABORATION WITH DEPARTMENT OF ENERGY

LEGEND

1. DIGESTOR
2. GLASS PURIFIER
3. PURIFIER
4. CHECK VALVE
5. DRIER
6. COMPRESSOR
7. GAS COOLER
8. DRIER
9. NON RETURN VALVE
10. LEVER VALVE
11. LEVER VALVE
12. VACUUM PUMP
13. PRESSURE GUAGE
14. GAS BOTTLE CONNECTION

From The Kitchen To Fuel: What Kitchen Waste Can Do For You

SHAHANIMALA
SUVA

Aside from students who come every year for the Fiji National University Open Day, villagers also gather in numbers to witness an interesting project they can develop themselves.

The School of Mechanical students at Samabula Campus have been working on a biogas plant project for three years.

But it was not from the waste of pigs or cattle or other livestock, that we know of, this time however it is from everyday kitchen waste.

Biogas typically refers to a mixture of different gases produced by the breakdown of organic matter in the absence of oxygen.

It can be produced from raw materials such as agricultural waste, manure, municipal waste, plant material, sewage, green waste or food waste.

Principal lecturer Dell Alagcan said: "This is something we have introduced to our students to make them recognise and appreciate the value of sugary and starchy material coming from kitchen waste that we use during our meal.

"We have done different levels of experiment on this project and we came up with the project in the processing. It has taken us three years."

Ms Alagan said this was used in Asian countries.

"It is cheap to use and people from rural and urban areas are coming to see this biogas and asking how we can



Video & Gallery: Biogas plant demo and more pictures from Open Day.

develop it."
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Media and Journalism students at the FNU Open day in Koronivia yesterday with the newspaper they produce, The Journalist. Photo: Shahani Mala



From left: Fiji National University's Manuel Alagcan, Dell Alagcan and Daniel Maharaj with the biogas plant at the FNU Open day in Samabula yesterday. Photo: Shahani Mala

Installation of Solar Panels at Vabea District school, Kadavu





- **Preparing for the installation of solar panels in Kadavu**



Training the village people on how to operate and maintain the panels, batteries, inverters and charge controllers in the installation of solar panels in Vabea District School, Kadavu







The Vabea District school and 46 students with the CEST staff, and German NGO EWB

INSIGHTS

Human Resource development and capacity building is fundamental to ensure sufficient capacity and skills are available.

- The academe as the training arm should work hand-in-hand with all stakeholders such as the industry with interest on sustainable energy , government and policy makers, financial institutions, development partners and other interest groups, other academic institutions, to develop relevant, inclusive programmes addressing or covering skills needed to contribute to the development of sustainable energy system in the country. All stakeholders need professionals with relevant skills.**

- **Long term and short term academic programs that are need based which address all issues of energy development shall be the role of the academic institutions. Furthermore, they play a central and pivotal role in the knowledge creation and the required dissemination of these programs.**

Thank you for listening to my presentation !!!
Big VINAKA!!!