Successful Renewable Energy projects in the FSM

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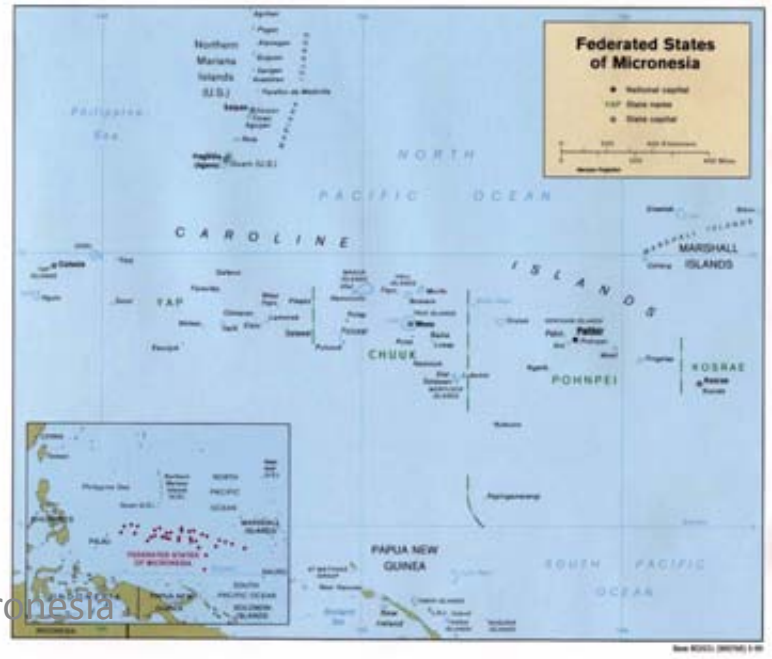
Federated States of Micronesia

Federated States of Micronesia

- 607 islands
- around 80 populated
- only main islands electrified by diesel grid
- electricity cost very high (between $ 0.40 and $ 0.50 per kWh)
- Government and private sector are actively looking for alternatives



Solar Energy … the solution?

- fossil fuel very expensive
- no frequent transportation to remote islands
- no wind data available
- high solar irradiation of 5.75 kWh/m^2/d
- Low maintenance

So…. Yes, solar energy is the reliable solution for electrifying the islands

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Solar PV Installations in FSM

- Over years many off-grid solar systems installed (small solar systems in schools, homes, dispensaries, municipal offices, churches etc.)
- 95% through grants
- Most of the systems for radio communications and some for water pumping
- Solar Home Systems (SHS) for several outer islands
- USDA Rural Development and the Asian Development Bank have provided matching grants for Solar installations in Chuuk
- The US Embassy and the Australian Embassy, FSM, have provided small grants for small solar projects on remote islands in Chuuk
- Earlier this year a major outer island electrification program by solar energy was done by the European Union

  -22 sites and in total almost 200 kWp solar
  Kosrae: 48 kWp grid-connected (5 sites)
  Pohnpei: 50 kWp off-grid on schools, dispensaries and municipal buildings
  Chuuk: 30 kWp off-grid systems on public facilities and one PV mini-grid systems
  Yap: 50 kWp two PV mini-grids electrifying two complete islands making them 100% renewable

REASONS FOR ALTERNATIVE ENERGY

- Independence from fossil fuels
- Desiring to join the "GREEN REVOLUTION"
- Cut utility costs
- "Keeping up with the Joneses"
- Unreliable public utility supply

- FACT IS: Remote islanders have NO POWER thus NO ALTERNATIVE but Alternative Energy

School – Mwoakilloa

Dispensary - Nukuoro

Mini-grid – Onoun

Dispensary – Pingelap

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Lessons learned

- Lack of ownership by the user
- Lack of adequate maintenance
  - No maintenance strategy
  - No maintenance budget
  - No spare-parts available
- Lack of knowledge
  - Frequently products are not suitable for harsh outer island conditions
  - Under-sized/improperly sized systems
- No battery replacement scheme and battery disposal program

Lessons Learned - Ownership

- Systems privately owned are better maintained
- Institutionalizing of solar systems with a clear maintenance budget
- Appointing of Energy Committees on the islands that consist of local leaders, school principal and health official
- Appoint local operator

Lessons learned - Maintenance

- Maintenance budget
- Ongoing training and certification of local operators
- Maintenance done by Renewable Energy Service Companies (RESCO)
    - Spare-parts locally available
    - Post Installation Support Program (PISP)

Misconception: “LOW Maintenance is NO Maintenance”


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Lessons learned - PISP

Post Installation Support Program (PISP)

-Solar Panels have a lifespan of 25 years, well maintained professional solar batteries 10 years and the electrical parts (controllers/inverters) 5-10 years (depending on quality and environment). This translates in to long-term maintenance commitments.

- Maintenance of PV systems normally starts after the 3rd year when the first problems start.

- Does this mean that we don't have any check-ups to do during the first three years?

-Lessons learned that the first three years are crucial for a long lifespan of the systems => need for PISP

- ➢Routine site visitation for system check-up during the first couple of years is essential.
- ➢Ongoing training of local operators (upgrade knowledge) extends system life and retains owner interest.

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Lessons learned – Products

- Products often not suitable for harsh outer island conditions.
- Wrongly chosen equipment for island environment
- Improper match of system components by end-users

➢ Need for standardization of systems

➢ Need for awareness in local vernaculars

VS

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Proper design, suitable for harsh island conditions…Projects by Bruton Enterprises

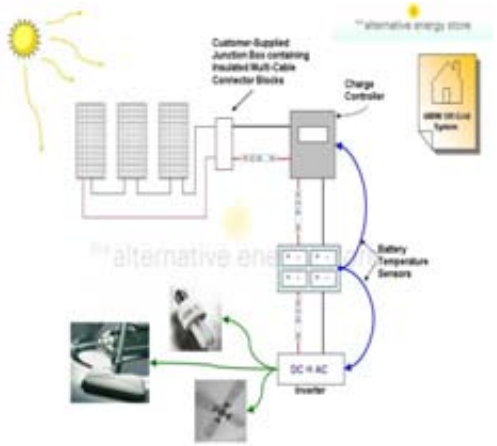
Lessons learned - Training

- Certification of local installers and maintenance personnel
- Regular training sessions
- More exposure to international progress on Renewable Energy
- Energy Efficiency is key in training and awareness building

➢ Capacity and Awareness Building

Sustainable approach for successful Renewable Energy Projects in FSM

- ✓ Proper site study
  - sizing
  - pre-design of system (hybrid versus stand alone)
- ✓Assessment of application prior to selection of equipment
  - appropriately matching desired load to energy supply
  - design the system with the island environment in mind
- ✓ Communication with end-users and communities
  - Site evaluation and preparation
  - Awareness creation and capacity building on energy management and efficiency
  - Community Energy Committee (except for privately owned systems)
- ✓ Provide systematic training for local technicians on proper installation and maintenance



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Sustainable approach for successful Renewable Energy Projects in FSM

- ✓ Have a Post Installation Support Program (PISP) in place and done by professionals (RESCO)
- ✓Have a maintenance budget allocated from day one running over the total lifespan of the system components
- ✓ Have a budget allocated for replacement of parts (batteries, controllers, inverters, etc.)
- ✓Have a professional (committed) company (RESCO) doing scheduled maintenance

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"assuring professionalism for sustainability"

DEPARTMENT OF ECONOMIC AFFAIRS
NATIONAL GOVERNMENT
FEDERATED STATES OF MICRONESIA

CERTIFICATE OF INCORPORATION

PC-01-09

Renewable Energy Association of Micronesia (REAM)

February 2009

"The product of professionalism is pride in your work, that leads to a quality installation"

Thank You

Our SUN

The ultimate renewable energy source!

…May it brighten your life, home and office…