Alternative Energy in American Samoa

Pacific Islands Environment Conference

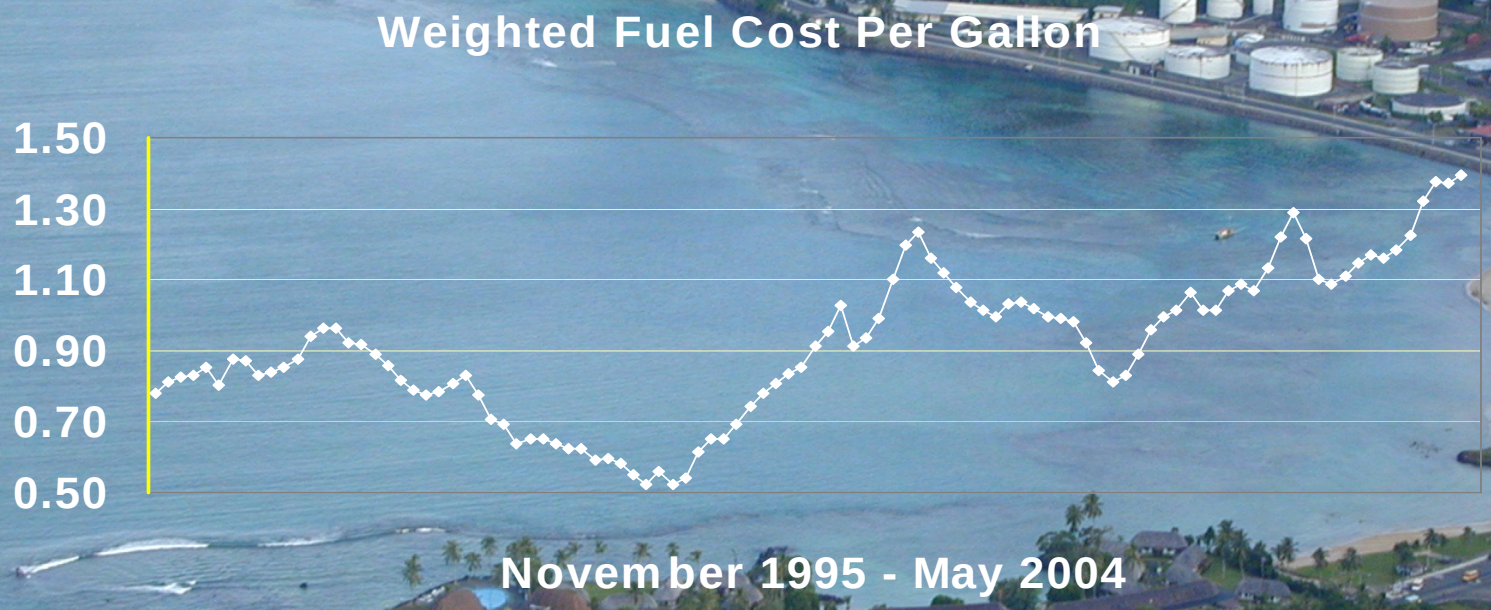
Dai-ichi Hotel – Saipan Beach
June 25, 2004

Jeff Shively

American Samoa Power Authority

- American Samoa's Renewable Energy Action Plan
- Alternative Energy Options
- Current Projects
- Conclusions

Why We Should Pursue Alternative Energy



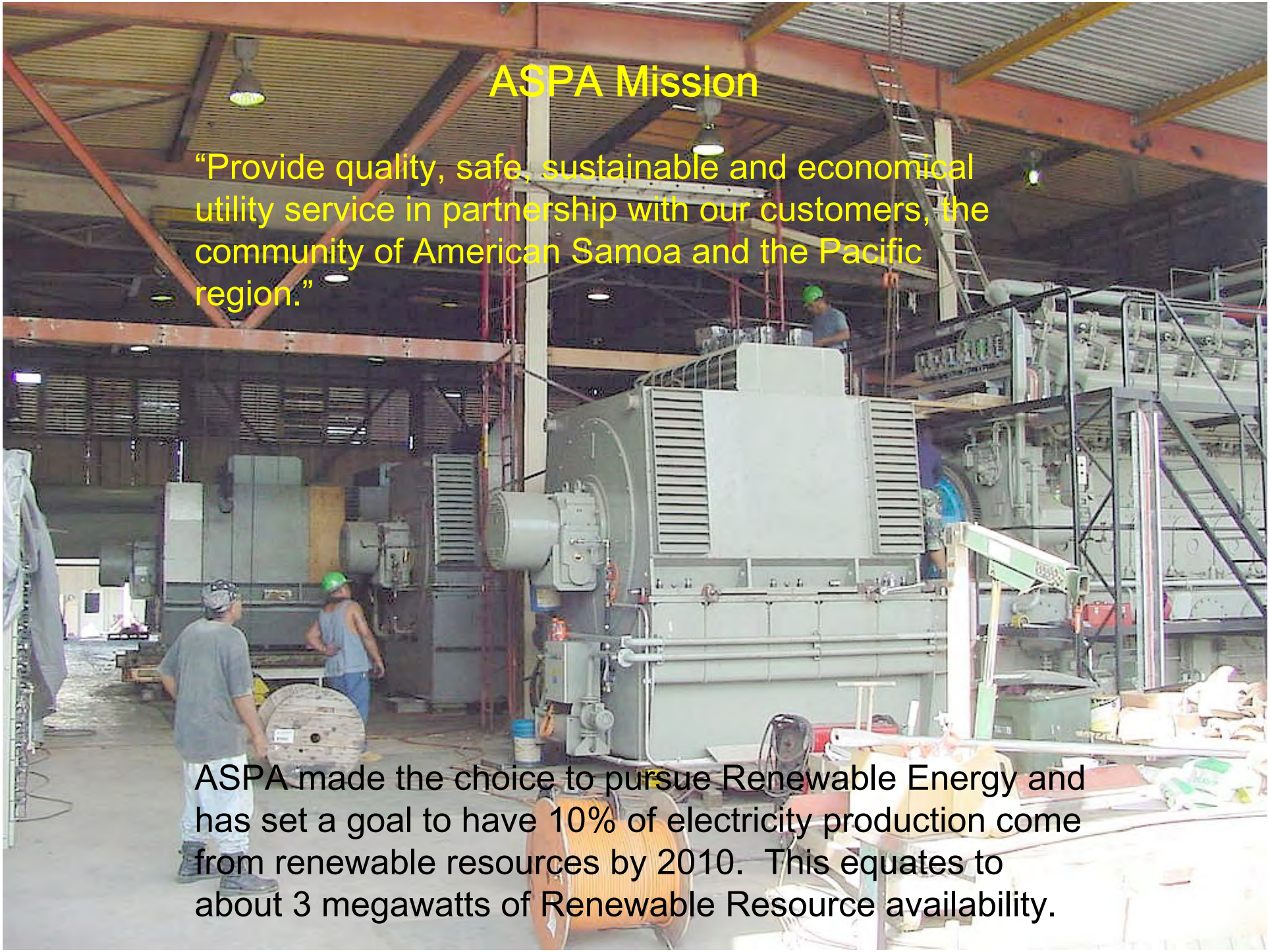
- Global events are creating uncertainties
- Be part of the pollution solution

Renewable Energy Action Plan for American Samoa

- Omnibus Territories Act (1980) P.L. 96-597, Section 604
  - Develop comprehensive energy plans emphasizing indigenous renewable sources of energy.
  - Demonstrate these technologies through existing programs.
- The Act was Authorized but never funded.
- DOE funded the Territorial Energy Assessment (1990) and the Renewable Energy Action Plan for American Samoa (1992).
- Lack of funding prevented further plan development.

Renewable Energy Action Plan for American Samoa

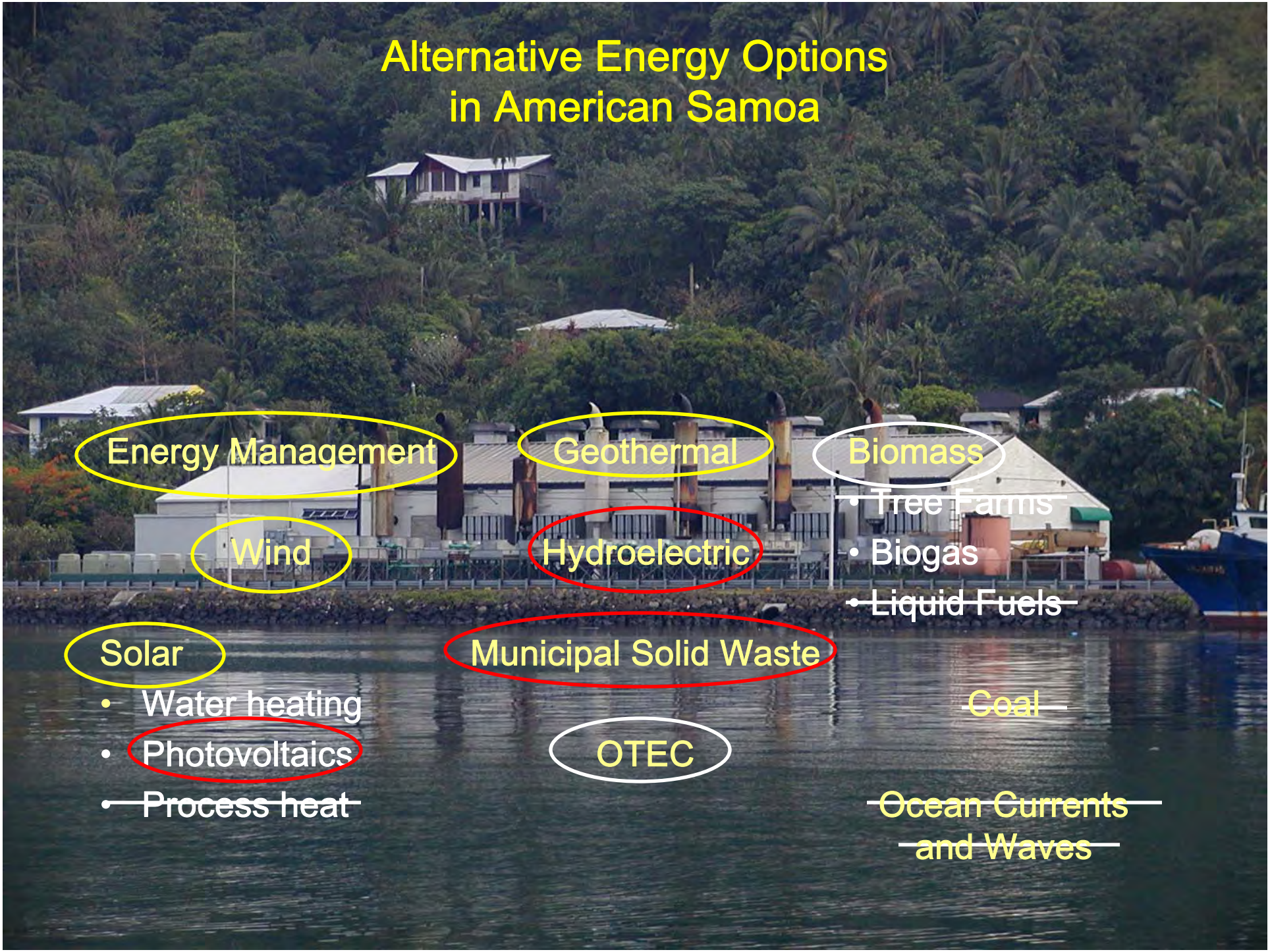
- Evaluated the major indigenous renewable resources.
- Furnished budget estimates.
- Developed by a solid team of experts.



ASPA Mission

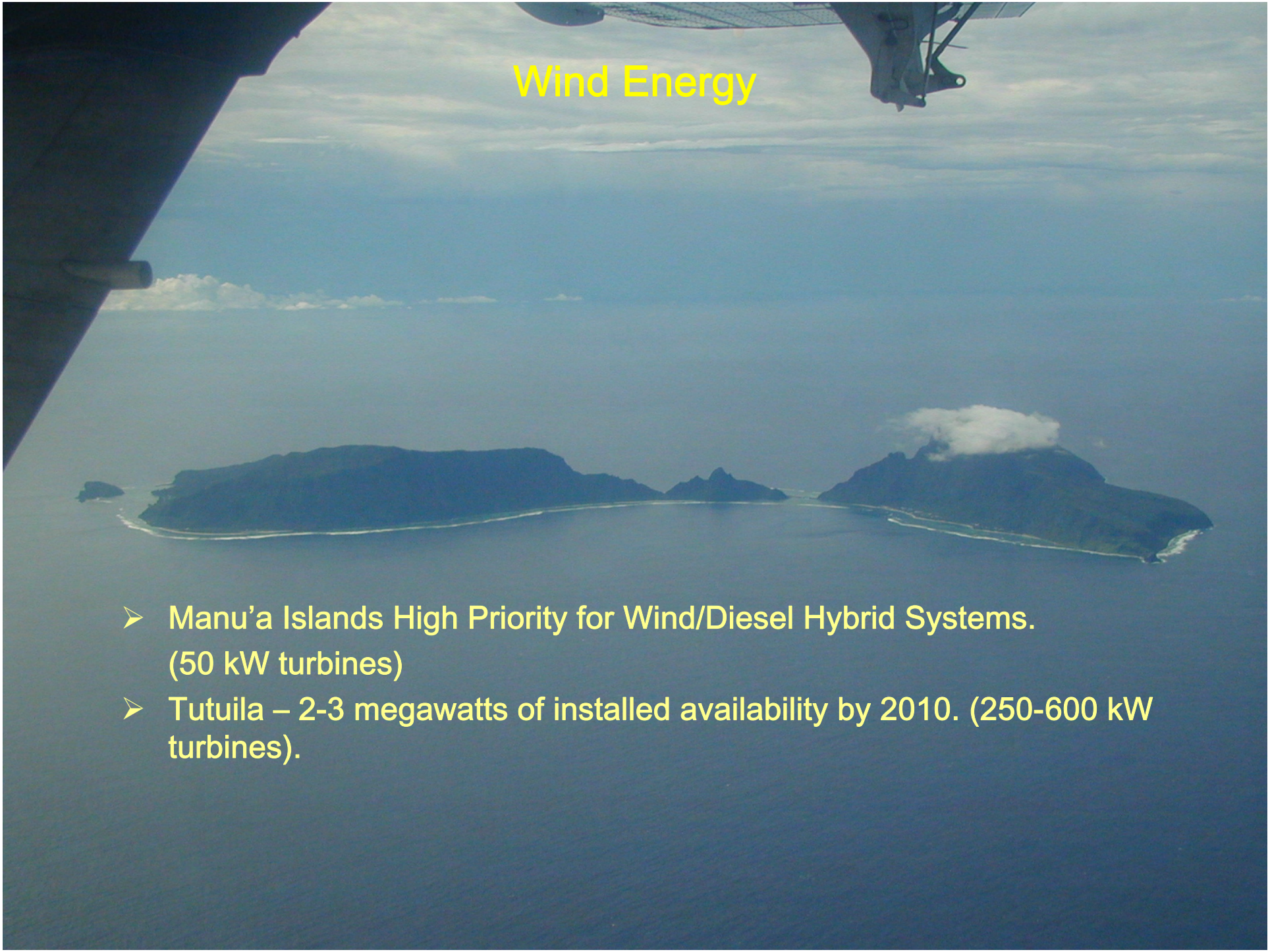
"Provide quality, safe, sustainable and economical utility service in partnership with our customers, the community of American Samoa and the Pacific region."

ASPA made the choice to pursue Renewable Energy and has set a goal to have 10% of electricity production come from renewable resources by 2010. This equates to about 3 megawatts of Renewable Resource availability.


Alternative Energy Options
in American Samoa
Energy Management
Geothermal
Biomass
• Tree Farms
Wind
Hydroelectric
• Biogas
• Liquid Fuels
Solar
Municipal Solid Waste
• Water heating
Coal
• Photovoltaics
OTEC
• Process heat
Ocean Currents
and Waves

Energy Management

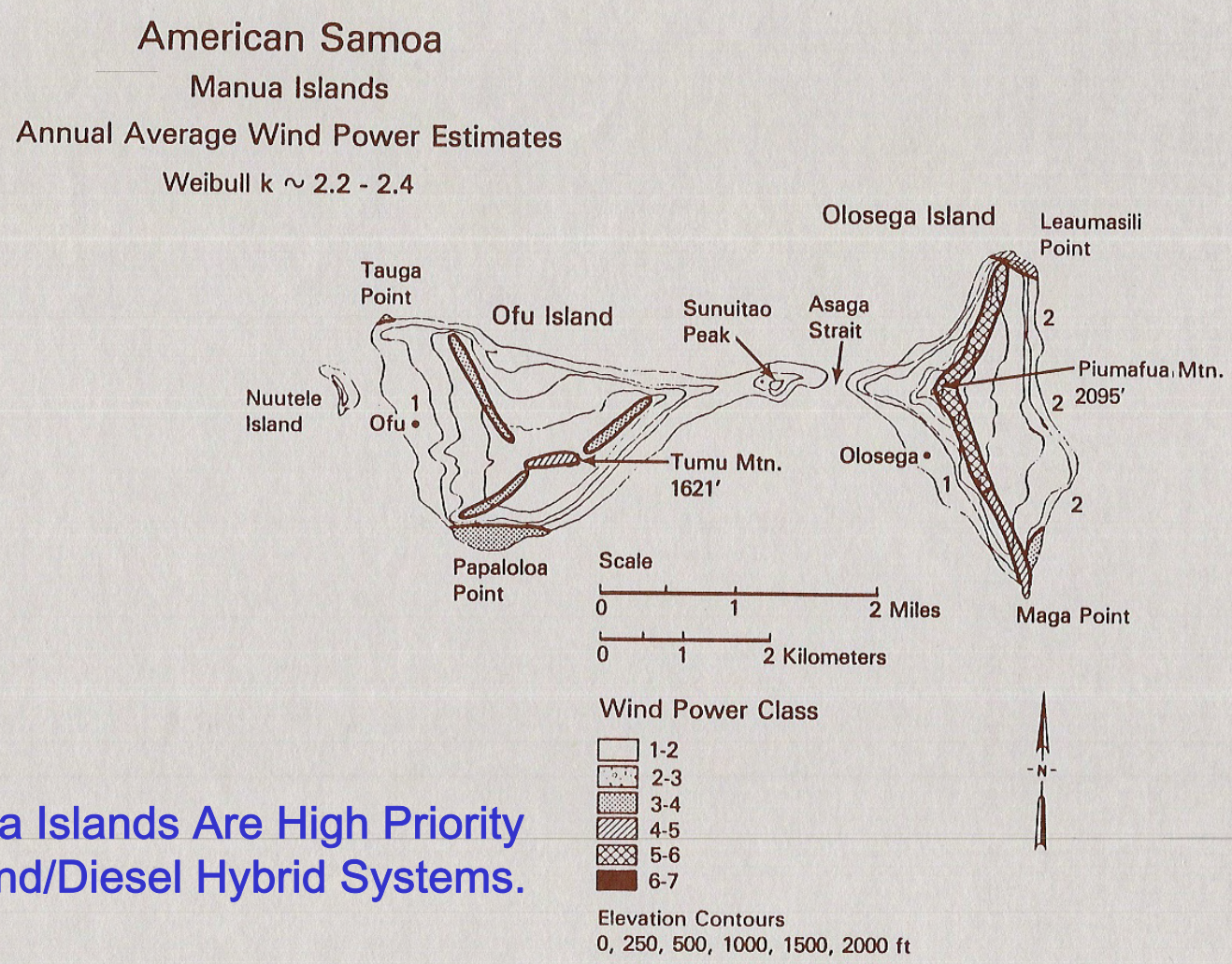
- In-house Lighting and AC upgrades.
- Waste Heat Recovery from Generators.
- Commercial Lighting Program.
- Other irons in the fire.



Wind Energy

- Manu'a Islands High Priority for Wind/Diesel Hybrid Systems. (50 kW turbines)
- Tutuila – 2-3 megawatts of installed availability by 2010. (250-600 kW turbines).

Ofu/Olosega Wind Map



Manu'a Islands Are High Priority for Wind/Diesel Hybrid Systems.

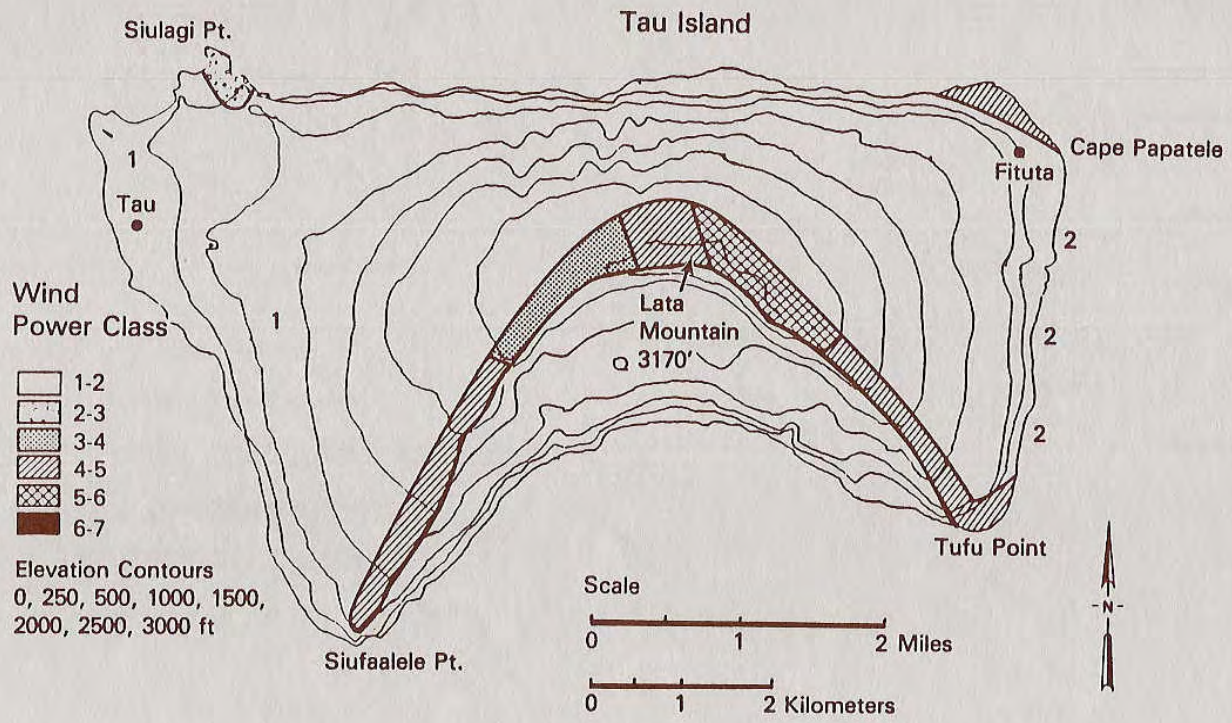
Tau Wind Map

American Samoa

Manua Islands

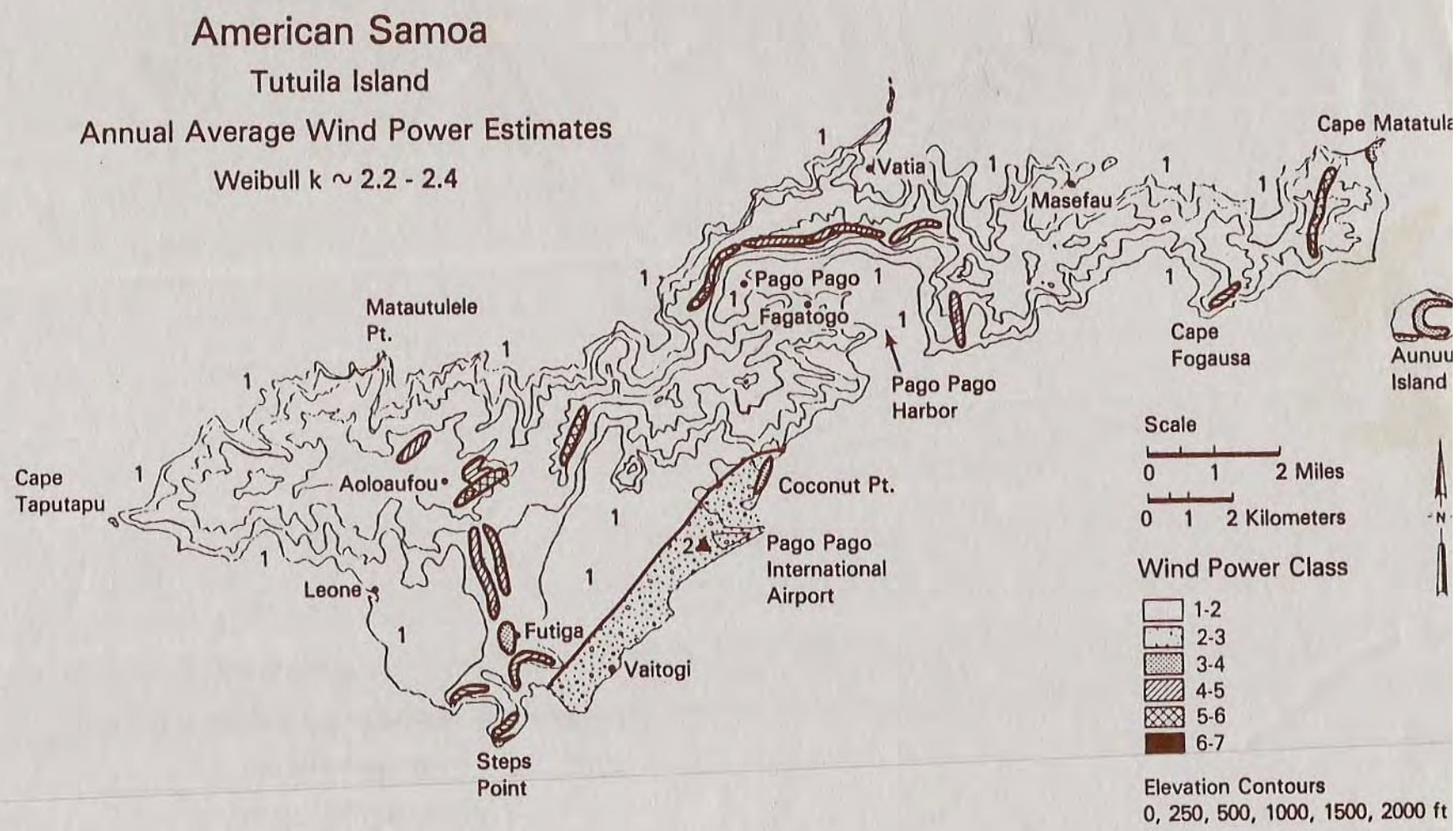
Annual Average Wind Power Estimates

Weibull k ~ 2.2 - 2.4



Tau, Manu'a Islands

Tutuila Wind Map

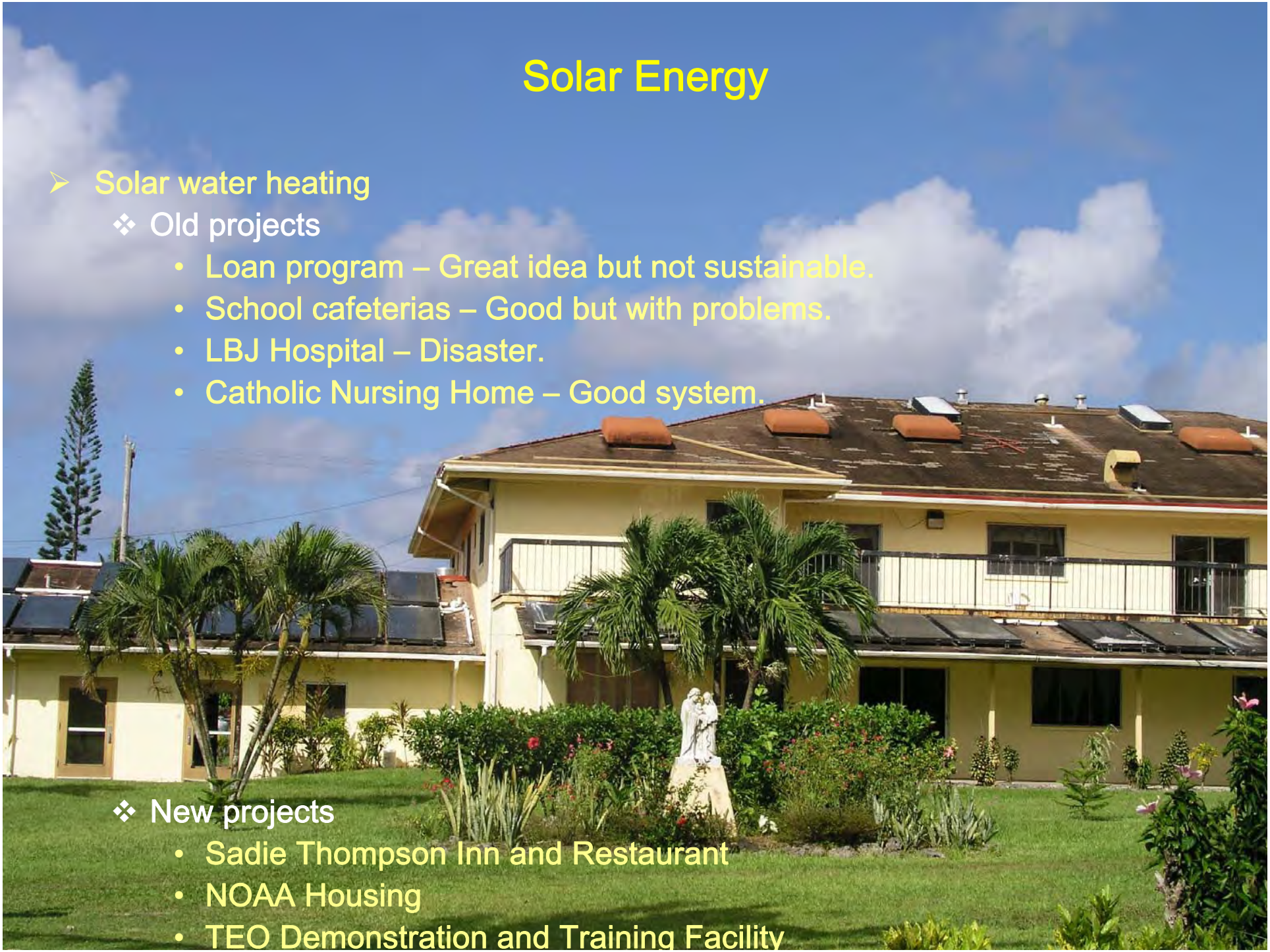


Wind Site
Olotele Peak – 8.1 m/sec average

Olomoana Ridge Estimated 7.5-8.0 m/sec average

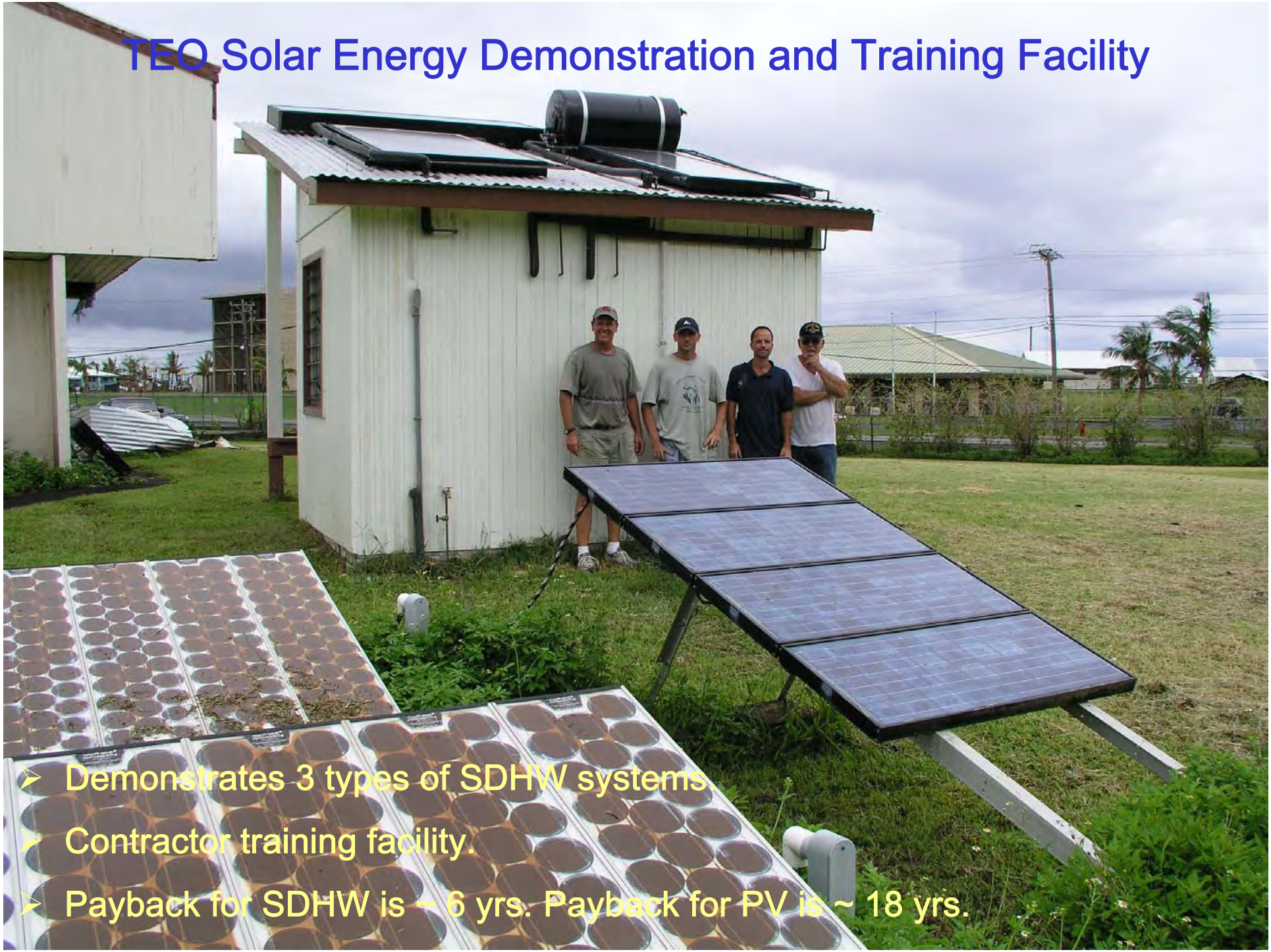
Solar Energy

- Solar water heating
  - Old projects
    - Loan program – Great idea but not sustainable.
    - School cafeterias – Good but with problems.
    - LBJ Hospital – Disaster.
    - Catholic Nursing Home – Good system.

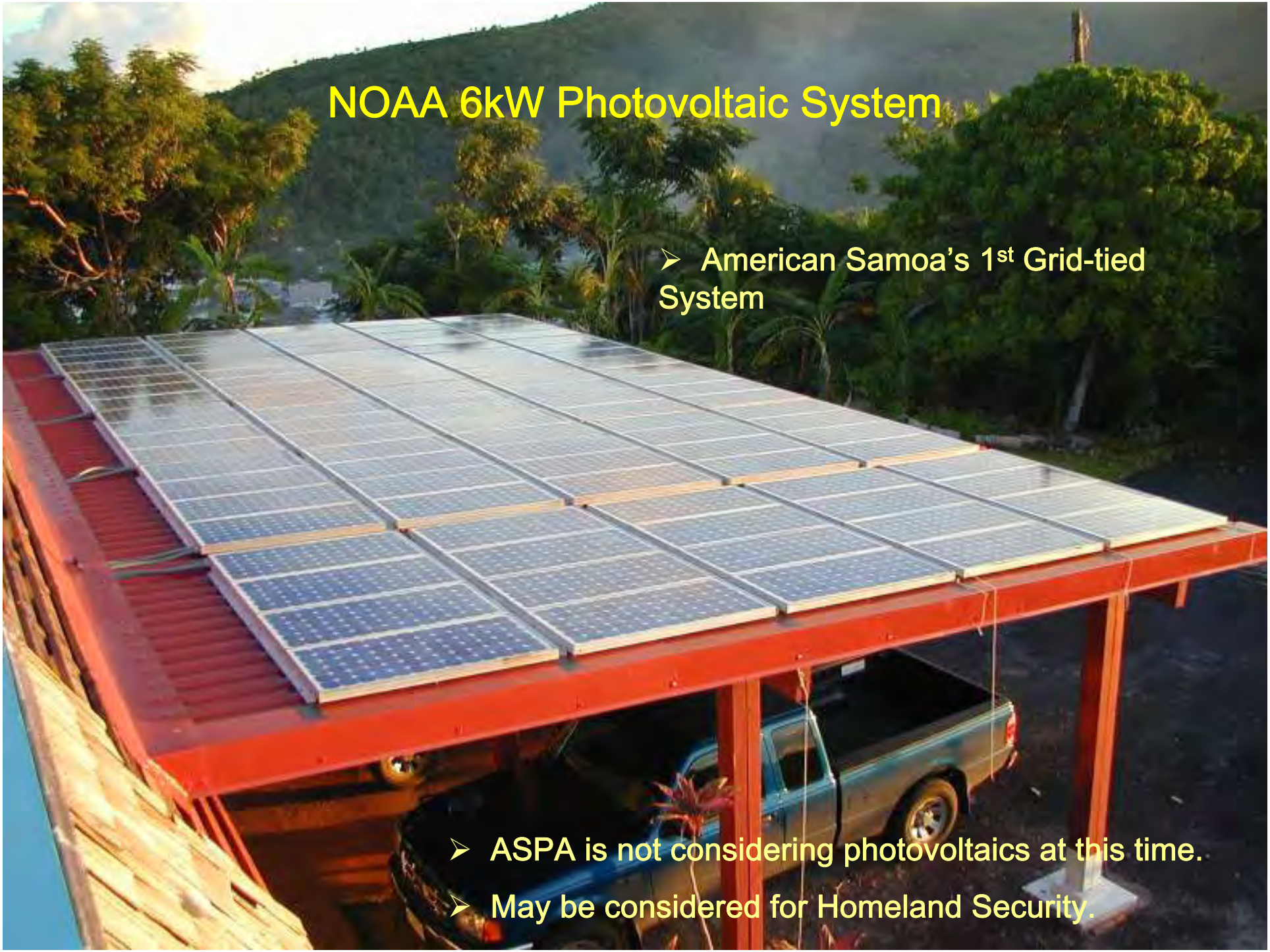


  - New projects
    - Sadie Thompson Inn and Restaurant
    - NOAA Housing
    - TEO Demonstration and Training Facility

TEO Solar Energy Demonstration and Training Facility



- Demonstrates 3 types of SDHW systems.
- Contractor training facility.
- Payback for SDHW is ~ 6 yrs. Payback for PV is ~ 18 yrs.

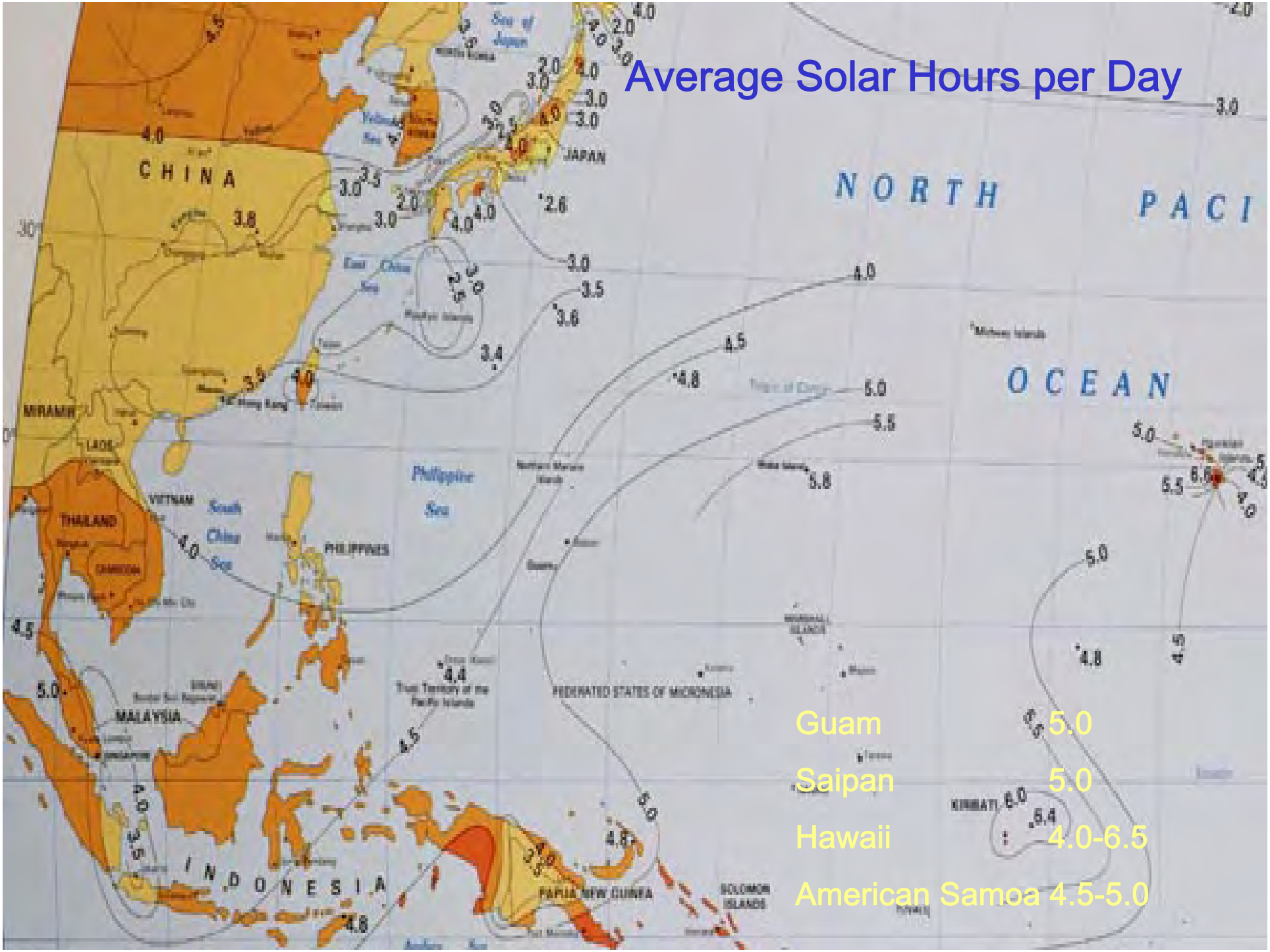


NOAA 6kW Photovoltaic System

- American Samoa's 1st Grid-tied System

- ASPA is not considering photovoltaics at this time.
- May be considered for Homeland Security.

Average Solar Hours per Day



Ocean Thermal Energy Conversion (OTEC)

- Benefits from OTEC
  - Mareculture business
  - Direct Air Conditioning
  - Electricity Production

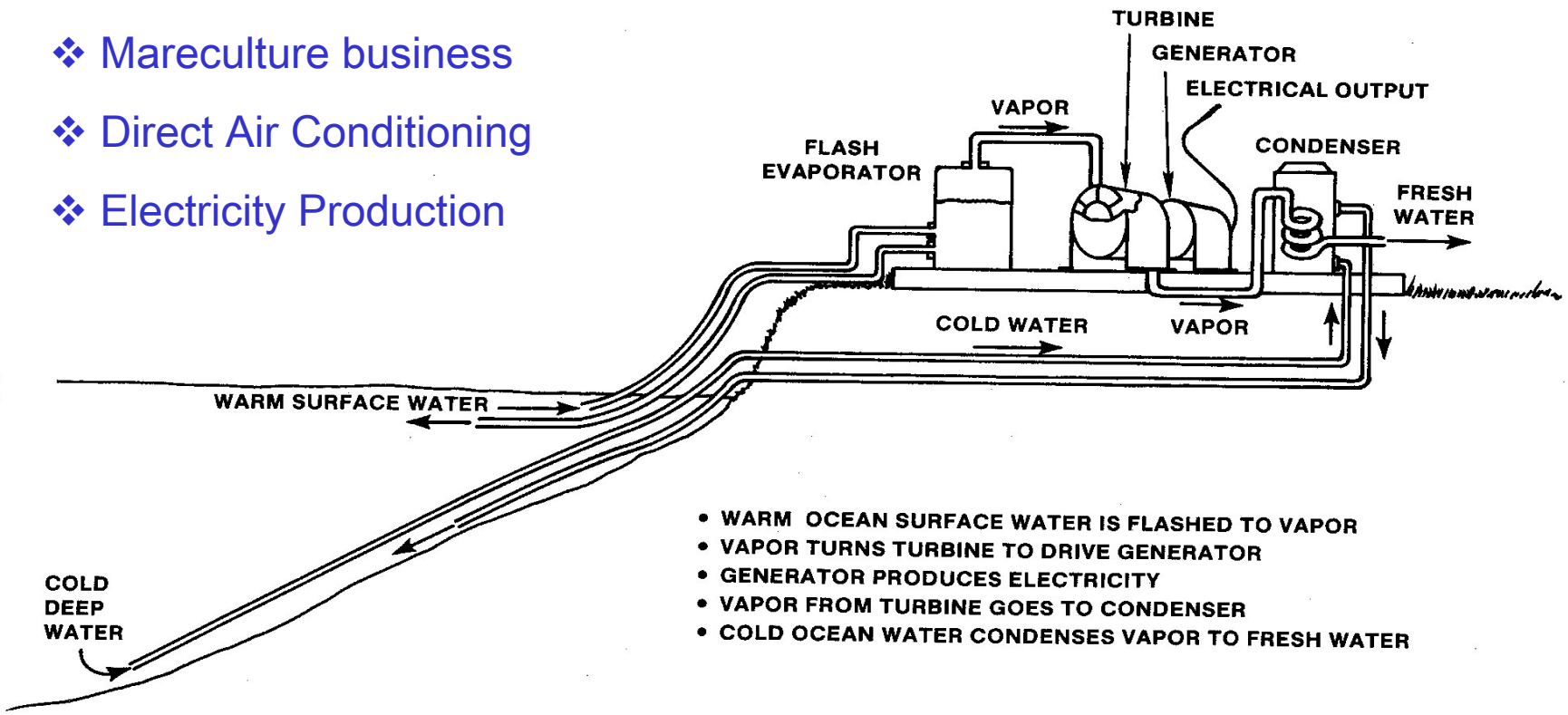


Figure 9. Open-Cycle OTEC Power Plant

Ocean Thermal Energy Conversion (OTEC)

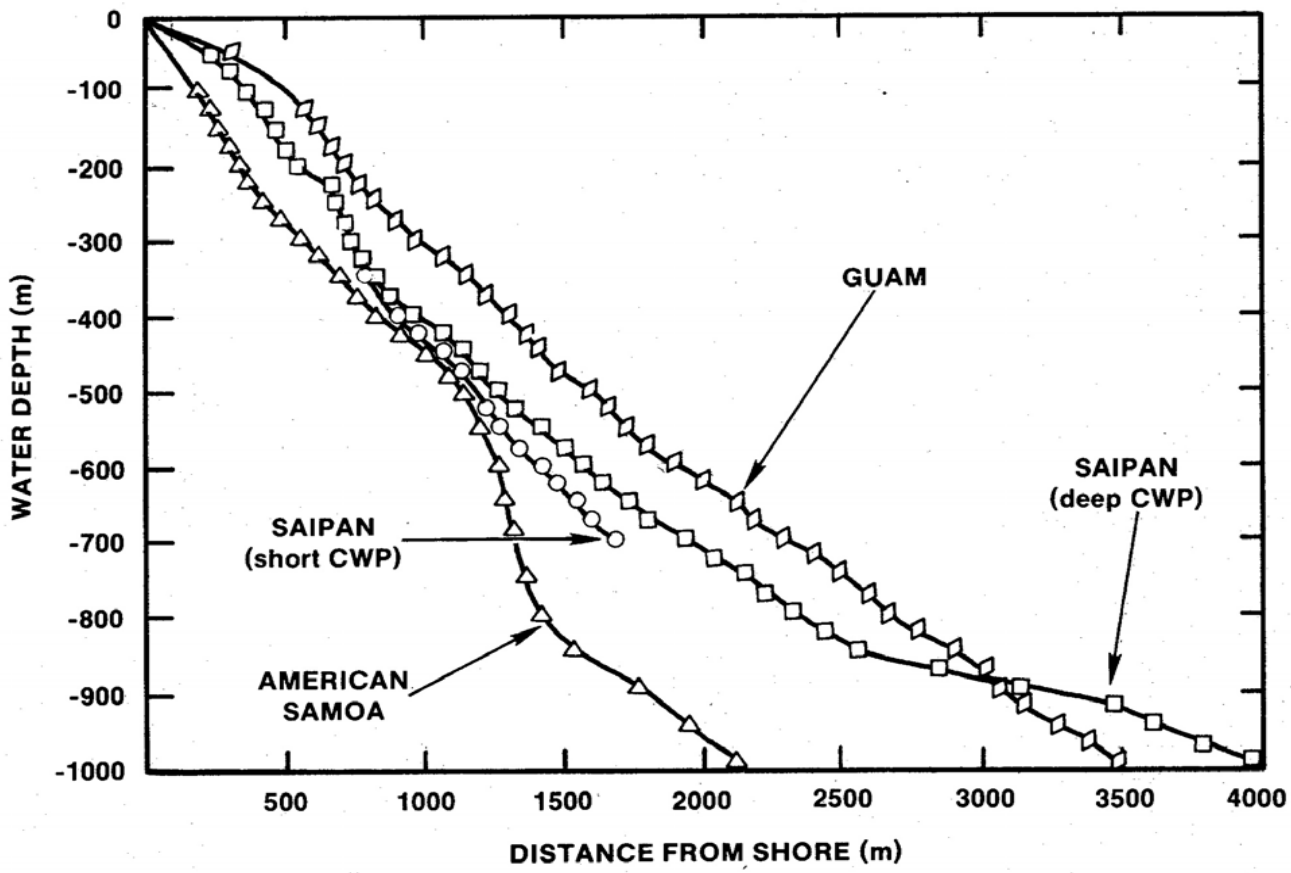
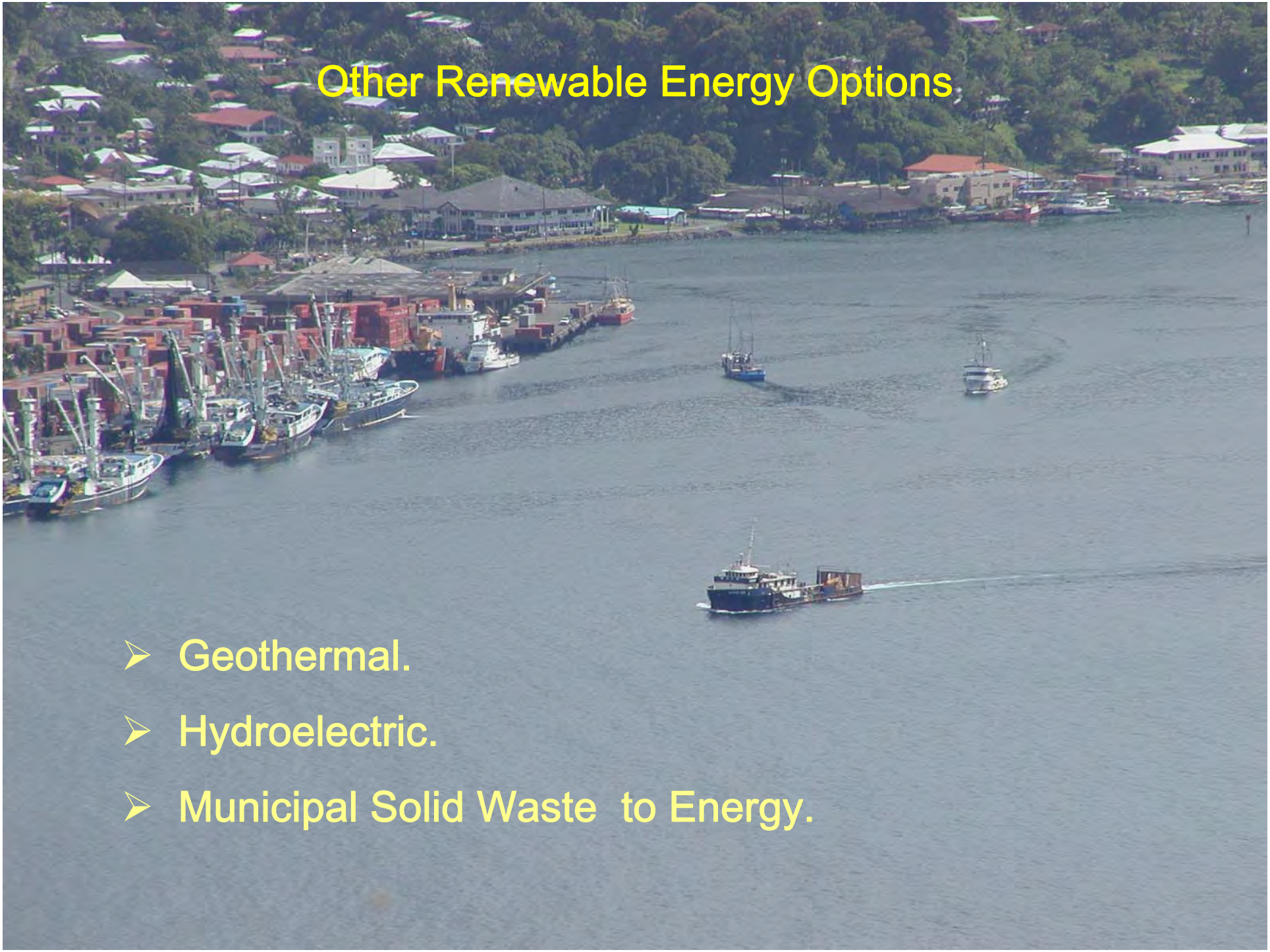


Figure 10. Bathymetric Profiles

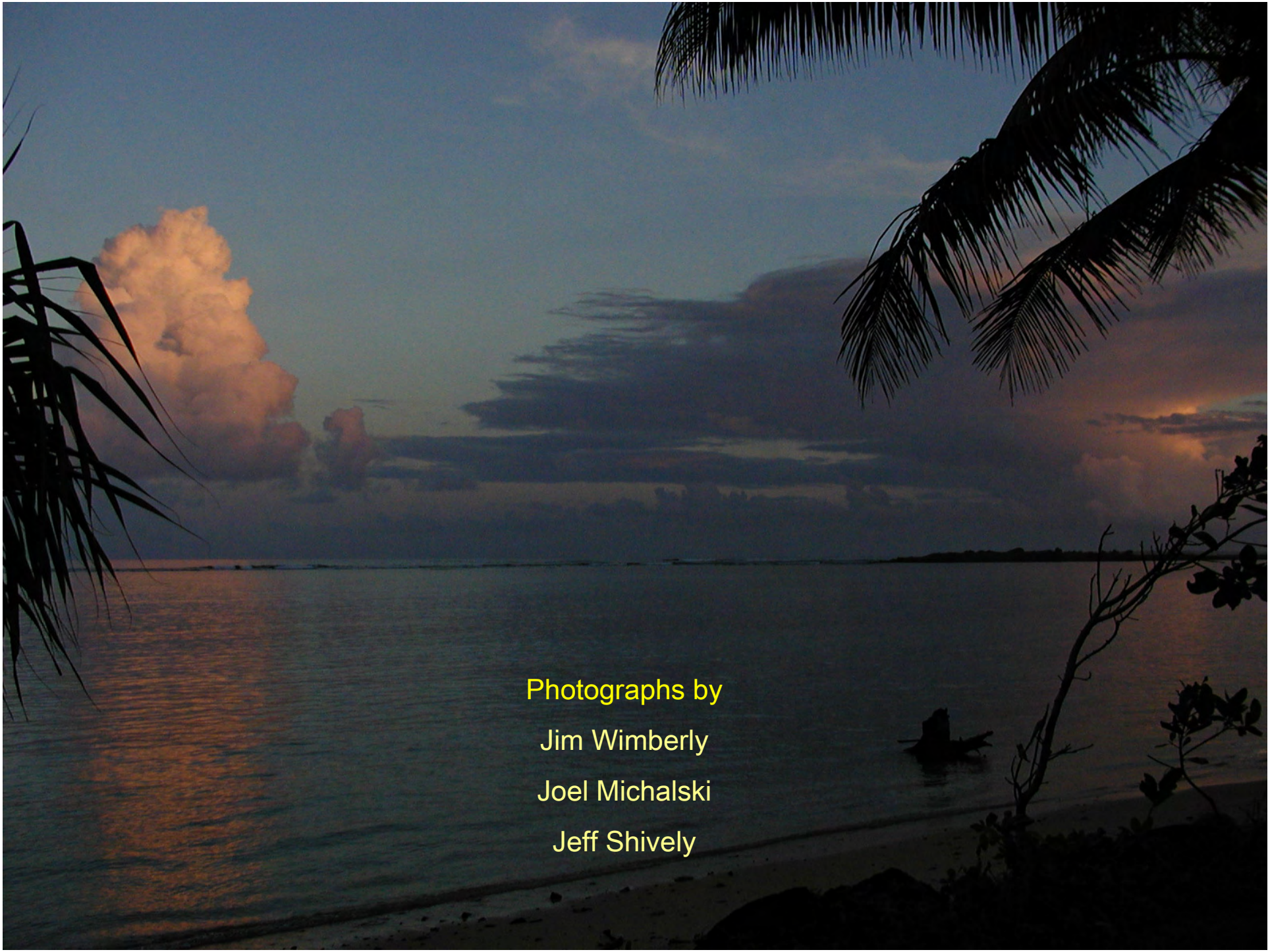


Other Renewable Energy Options

- Geothermal.
- Hydroelectric.
- Municipal Solid Waste to Energy.

Conclusions

- Uncertainties.
- Reliability, efficiency and renewables.
- Commercially feasible options.
- Lost opportunity.
- Hawaiian role model.


Photographs by
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