

Renewable Energy and Energy Efficiency in the Hotel Sector on Islands

**Good practices, obstacles
and lessons learnt**

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Informationsveranstaltung Kap Verde

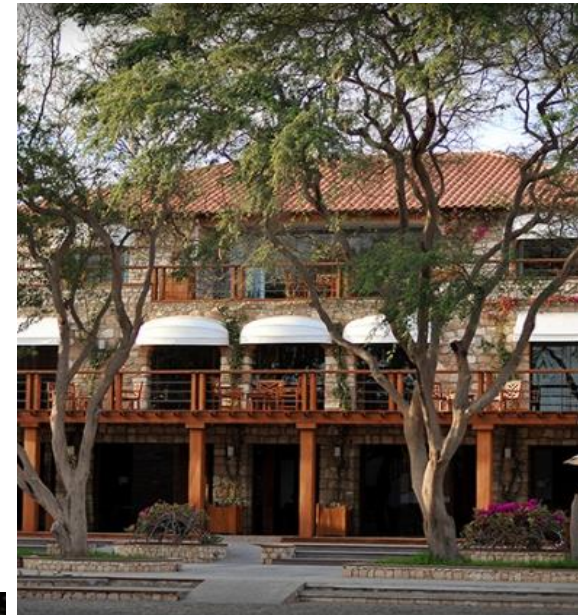
Energieeffizienz und Erneuerbare Energien in Gebäuden mit
Fokus auf die Tourismusbranche, IHK Stuttgart, 16.März 2016



Hotel Morabeza, Isla Sal, Cabo Verde

Enabling Conditions:

- Constant trade winds with permanent North-East orientation.
- Permanent sunshine.
- Research on renewable energy systems suitable for the hotel, initiated by the founders of the Hotel, Mr. and Mrs. Gaspart Vynckier-Massart as early as 1966
- Partnership with company specializing in renewable energy.





Hotel Morabeza, Isla Sal, Cabo Verde

Pioneering Action for Renewable Energies and Eco-Management in Hotel Sector in Cabo Verde:

- Installation of a sea water distiller powered by solar energy in 1966.
- Set up first solar panels on Cape Verde and three parabolic mirrors to cover needs for hot water production in 1980.
- Wind power plant of 55kw installed in 1985 which produced approx. 60% of the accommodation's electric needs.
- Wastewater recycling plant set up in 2003.
- 80 % of air conditioning provided by wind farming.
- Wind farm replaced solar distiller which also produces energy to desalt sea water.
- Recycled water is used to water gardens and flushing toilets.





Soneva Fushi Resort, Kunfunadhoo Island, Baa Atoll, Maldives

The most advanced case of Renewable Energy (RE) use on the Maldives

Achievements:

Solar Power

70KW Photovoltaic (PV) power plant,
the largest renewable energy plant in the
Maldives when installed in November 2009
700 KW currently under construction



Biomass to Charcoal

Wood waste is made into biochar fertilizer and charcoal that is used at the resort.

The Adam Retort oven cooks the wood, allowing to store carbon, improve soil fertility and reduce imports of charcoal for barbecues



Soneva Fushi Resort, Kunfunadhoo Island, Baa Atoll, Maldives

Obstacles

Solar Power

- Not enough space on buildings and on the island to use full solar potential, because of natural roof material and use of tree shadow to avoid direct solar heating of villas;
- Lack of storage for solar energy to meet high energy needs during the night.



Wind Power

- Soneva in its plan to become the first carbon positive resort planned to support a wind turbine on the neighbouring island of Eydafushi, but failed due to lack of wind data and possibility to feed in local network
- This Suzlon 1,5 MW turbine was built by Soneva with NGO partners in Tamil Nadu, India, to support local communities and offset all flight emissions of Soneva guests.



Kauai Resort and Spa, Hawaii

Action and impact:

- Solar photovoltaic system (18,500 sq. ft.) produces 465,000 kWh annually.
- LED light replacement of approximately 15,000 bulbs reduced lighting kWh by 70%.
- Air-conditioning is controlled through Energy Management System.
- Electronically controlled timers on exhaust fans in kitchens and pumps for water; savings: 250,000 kWh / year.
- Voluntary linen change for guests; savings: over 500,000 gallons of water / year.
- Nearly 60,000 sq. ft. of grass covered roofs reduce cooling needs.



Banyan Tree Hotel Seychelles

Action and impact:

- Tests to transform used cooking oil into Biodiesel on GM's car and minibus in 2009.
- Successful tests resulted in purchase of fuelpod 2 to convert used cooking oil into Biodiesel which can be used in all Diesel-operated engines.
- Now running the resort's entire fleet of diesel vehicles on recycled cooking oil.
- The hotel also collects used cooking oil at no charge from nearby resorts. Usually cooking oil is waste and is collected and shipped to Africa for disposal.
- Resulted in wider plan of implementation for similar biofuels in other locations in 2010.
- Total production approximately 2,000 liters of Biodiesel a month; savings: US\$1,700/month.

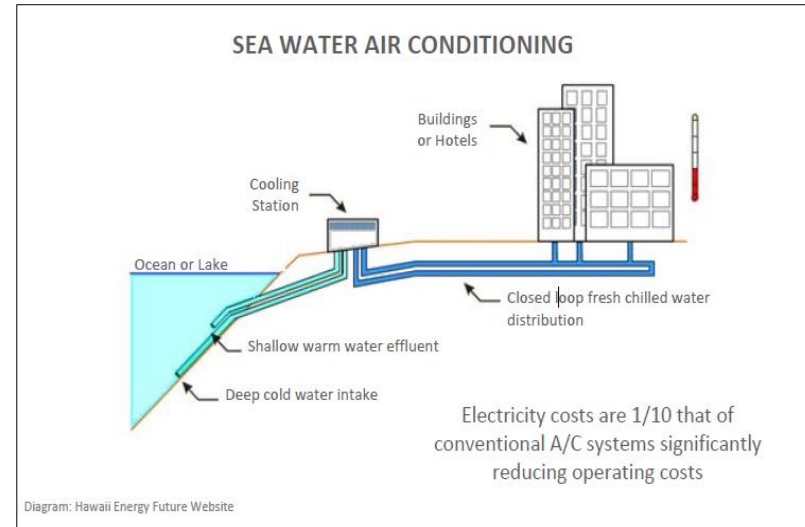




InterContinental Bora Bora Resort, Bora Bora Island, French Polynesia

Action and impact:

- Sea water air conditioning (SWAC system);
- consumes approximately 10 times less electricity than conventional air conditioning systems; savings: AUD\$500,000 / year.
- 62 solar panels supply staff locker rooms, laundries, villas and bungalows with hot water.
- Energy saving light bulbs and motion sensors for indoor lighting.
- Staff mobility in





Aldemar Resorts, Greece (Crete, Rhodes, Peloponnese)

Action and impact:

- **7,010 square meters of solar panels**, covers 85% of Group's need for hot water.
 - Water consumption regulated through mechanisms in taps.
 - Central electrical switches in all rooms.
 - Energy-saving light bulbs throughout the hotels.
 - Water-cooled air conditioning units; savings: 40% / year.
- The group's benefits from the solar farms and energy recovery amount to on average of **2,500,000 Kwh/year**





Aldemar Resorts, Greece

Recycling:

- In 2011 Aldemar resorts recycled 4,000 light bulbs; 230 items of computer equipment; 12,000 kilos of cooking oil; 419 kilos of batteries; 9,000 kilos of paper; 69,500 kilos of glass.
- Biological cleaning systems - savings: 35% / year
- Wastewater treatment systems store and clean water, then used for the hotel gardens
- Aldemar group has received many eco- and sustainability awards and certification,





Peppermill Resort Spa Casino, Reno, Nevada, USA

Geothermal Heating (*not on an island, but perfectly transferable to volcanic islands*)

Action and impact:

- Investigated new and innovative ways into geothermal energy employing geothermal expert, Dr. Jim Combs
- \$9.7 million investment in 2007
- Drilled 4400 ft. deep well which pumps 1,200 gallons per minute at 150 psi
- Installed closed loop system: hydronic system to heat or cool the facility.
- Cooling: cold water is cooled by pre-chill system; pre-cooling process saves the resort approximately US \$5,000 per 24 hour.
- Heating: geothermal heats entire facility (1.2 million square ft.); savings: approximately US \$1,7 million / year.





Obstacles and Lessons Learnt

The hotel owner/operator dilemma

Big international brand hotel companies normally do not own the properties which they manage. Therefore they cannot invest in renewables to reduce their cost and carbon footprint because:

- The owner has to agree to allow RE installations in his property – but often he doesn't benefit because energy cost savings do not increase his rental fee;
- Banks will not give a credit to a hotel operator for an installation which is part of the building of another owner;
- Hotel operators cannot finance major upfront investments for RE facilities from their cash flow, even if they only have to invest a minor part as a co-financing with credits from other sources





Obstacles and Lessons Learnt

The role of local energy providers, often monopolies

- Local energy providers do often not agree to allow RE feed into their energy supply system, especially if they have a safe and huge profit from conventional energy generation;
- If local energy providers have the monopoly to sell energy, such as in the Dominican Republic, this makes it impossible to implement energy contracting solutions with hotels even if no feeding-in is necessary

CEPM, Consorcio Energético Punta Cana-Macao - de simple generadora eléctrica de Punta Cana, a multimillonario consorcio energético.

<http://puntacana-bavaro.com/index.php/noticias/item/788-cepm-de-simple-generadora-el%C3%A9ctrica-de-b%C3%A1varo-a-multimillonario-consorcio-energ%C3%A9tico>





Obstacles and Lessons Learnt

The “technology gap”

- For hotels with their own – off-grid – energy supply based on diesel generators, which is often the case especially on small islands or in isolated locations, a 24 hour renewable energy supply would be the best solution, keeping the generator only as a back-up.
- This can only be achieved when major storage facilities are being built, for instance with big conventional batteries. But this would nearly double the cost of the RE installation and make it less, if not unprofitable.
- Hybrid systems which combine the conventional diesel-generated energy with RE whenever available can only cover a maximum of 30% of a hotel’s total energy demand.
- Hybrid systems, even though the investment might pay back in acceptable times, are not very popular because they require a hotel to operate and maintain 2 separate energy systems at the same time.



The way out: What needs to be done?

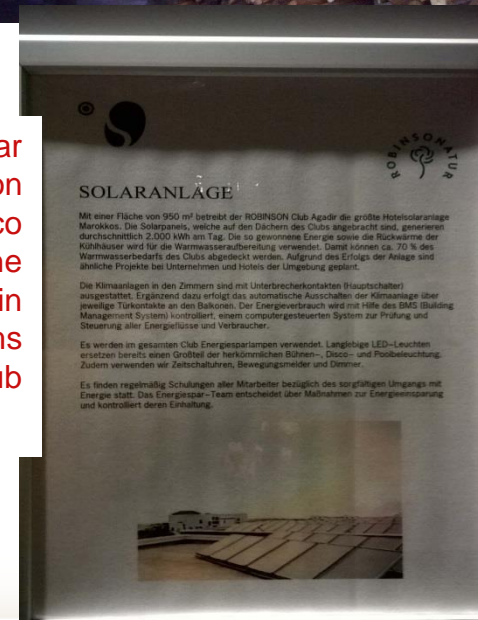
A country or island-level strategy to support the use of Renewables (RE) and Energy Efficiency (EE) in tourism and hotels would have to:

- **Analyze past successes and failures of initiatives and trials / pilot projects to promote RE/EE for hotels and tourism, in order to identify the obstacles and success factors for such investments under the specific country conditions;**
- **Sit down with all relevant stakeholders of the hotel&tourism industry to learn about their experiences and concerns with respect to the investment in and use of RE/EE technologies**
- **Develop and implement a joint strategy with hotel&tourism and energy sector and other relevant stakeholders (e.g. public regulators, financiers, etc.) in order to make RE/EE use in hotels&tourism an easy and attractive option, by overcoming in particular the existing obstacles.**

Jetwing Hotels Sri Lanka uses wood waste from Cinnamon production to heat water when solar hot water is not available



The 950 m² Solar Heaters of Robinson Agadir/Morocco cover 70% of the hot water used in this 350 rooms Holiday Club

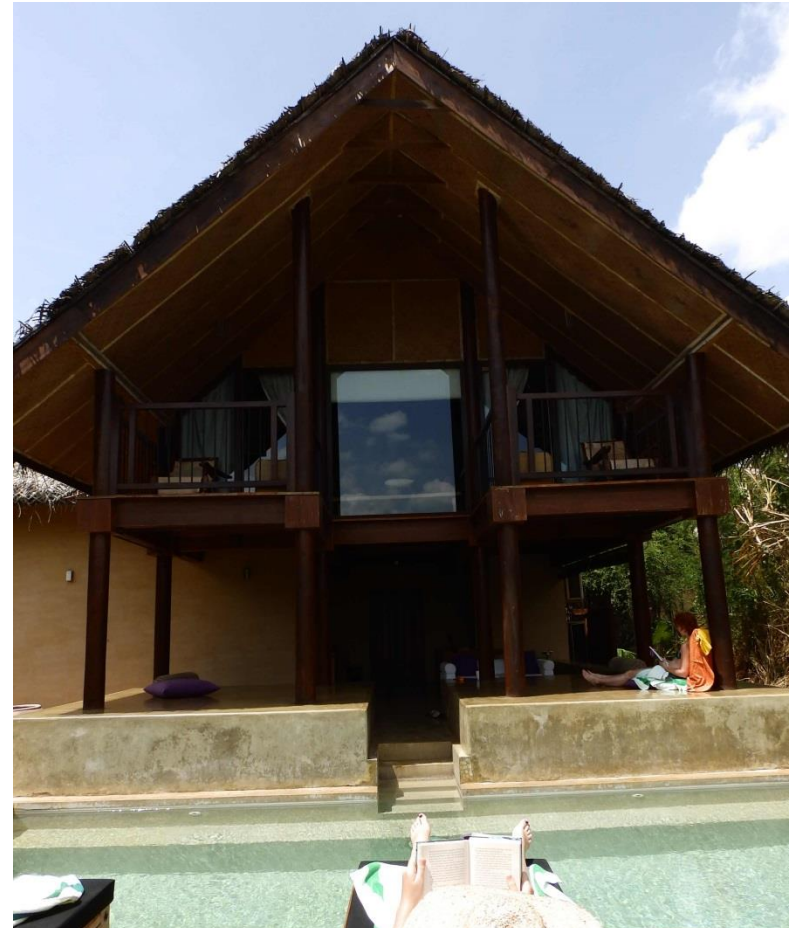




The way out: What does not help?

What has not been very helpful in the past is:

- To prepare another technical and financial publication which shows hotels how to use RE/EE and how much money it could save – there are already enough such guidelines, manuals and websites which so far did not have a major impact;
- To finance and build pilot RE facilities for hotels&tourism under specific and non-repeatable conditions, just to show that and how the technology works.
- To offer credits to hotels where the owner is not the manager



Jetwing Vil Uyana´Sri Lanka: The architecture of these 25 luxury villas is not only attractive, but also protects the rooms from direct solar irradiation and uses natural ventilation to keep the rooms cool



Thanks for your interest !

Soneva Fushi Resort, Baa Atoll, Maldives