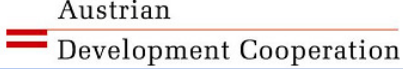


Lessons Learned, 5 Years of Project Development in the Caribbean



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- **SOLID** solarinstallation+design is the Global Leader in Large Scale Solar Cooling and Process Heating Plants out of Austria. This SHW technology offers great opportunities in the region with very good payback results.
- **RED** represents SOLID out of Jamaica for the Caribbean region and together they have start the development of more than 30 projects in the last 5 years.
- Since 2008 the  has supported the market development cost for SOLID efforts.

The Technology

- SOLID uses large scale solar hot water panels that can deliver a constant temperature of up to 100 C.
- By combining these into large fields, large volumes of hot water (energy) can be harvested.
- These volumes can be used for process heating purposes or solar cooling.
- In the case of solar cooling a special absorption chiller is integrated into the existing AC system, delivering cold water, which can reduce up to 75% of the electricity need of the AC system

Advantages / Financials

- SOLID systems save up to 75% of the energy use.
- The systems need at least 2.5 times less space than a solar PV system due to a much higher efficiency.
- The peak for cooling needs match systems production perfectly as such it reduces demand loads.
- Low maintenance and fully automated operation.
- Designed to work for 25 years plus.
- Excellent payback. Solar Cooling +/- 7 Y and Solar Process Heating +/- 3 Y, Combined +/- 5 Y.

Where can it apply

- SOLID offers a decentralized solution that directly benefits the end users facility.
- Solar Cooling can be integrated with central AC systems. Users: Offices, Airports, Hospitals, Universities, Hotels, Shopping Malls.
- Solar Process heating can be integrated with existing industrial hot water processes such as: Pre Heating for Steam, Cleaning, Pasteurization, Laundry, Hotel hot water needs.

Example 1. CGD Lisbon

- Largest Solar Cooling Project in the World.
- 100,000 m² space, 11 floors, 6,000 employees.
- 1,580 m² of panels deliver 900,000 KWh
- Start of operation 2008



Example 2. Olympic Sailing Village

- Solar Cooling and Solar Hot Water system at Qingdao in China.
- Heating the pool and 980 room hotel, provide cooling for the admin buildings.
- 1,300 m² of panels.



Example 3. Gatorade Arizona

- World's most efficient solar process heating plant.
- Supplying over 1 million KWh per year
- Preheating of 10,000 G of water to 35 C.
- 890 m² of solar panels.



Currently under Development

U.W. College Singapore

- Largest Solar Cooling and Solar Hot Water system in the world.
- Cooling of 20,000 m² of office space and delivery of all the hot water needs.
- ESCO project
- 3,900 m² of panels



Why the Caribbean Region

- The region has an extremely high dependency on fossil fuel which results in high energy prices.
- Tropical weather results into 2 / 2.5 times higher energy yields for SOLID's technology.
- These both factors make the technology much more affordable. Most project attract payback that is less than half of that of our European projects.
- High demand for cooling. In many buildings cooling represents around 50% of total electricity use.

What did we learn

All seems in place however the right mix needs more synergy from all stake holders.



**WRONG
WAY**

Public and Private Sector

- Although most corporations pay since 2004 more for energy than for labor they do not focus on fixing this situation and wait and see if it will go away.
- Projects with a payback of more than 3 to 4 years are not accepted. Hotels and Manufacturing.
- There is no budget made available and high interest rates make projects even more unattractive.
- Top management changes quickly +/- 4 years which results into short term strategy

Public and Private Sector

- At most patch projects are carried out to look good but larger projects needed do not get approval.
- Cost to develop projects are not accepted in many cases.
- Private and Public Sector players need to think long term and develop their energy strategy.
- Without this international competition will not be possible.

10% priceincrease per Y

Energy Cost	Price per KWh
Year 1	\$ 0.32
Year 2	\$ 0.35
Year 3	\$ 0.39
Year 4	\$ 0.43
Year 5	\$ 0.47
Year 6	\$ 0.52
Year 7	\$ 0.57
Year 8	\$ 0.62
Year 9	\$ 0.69
Year 10	\$ 0.75

Financial Institutions

- High Interest rates, difficult contractual arrangements and high amount of guarantees are currently requested. This often becomes unattractive for investors that look abroad for alternatives.
- Energy is always needed for every business to operate and large investments are needed. Local banks need to see this and come on board.
- ESCO contracts can spread risks and need more focus of local banks as this more than likely this will be widely used in the future.

Government

- Many Countries do not have an energy policy.
- Governments only seem to invest in large centralized projects and do not invest enough into decentralized projects that reduces energy cost.
- Governments rely heavily on international funding for Renewable Energy and policy development.
- Governments try to solve the problems to much by themselves and do not give enough opportunities to home owners and private sector to benefit from the use of Renewable Energy.

Government

- Governments work to slow and are often compromising to much which results into creating a weak enabling environment for RE and EE.
- Energy supply monopolies continue to exist.
- Incentives for RE are weak or not existing.
- Governments need to act quick and decisive and create / co-invest into incentives that will lower the payback time significantly of the investment for home owners and public and private sector entities that need RE to lower their operational cost.

International Stakeholders

- Focus in international corporation is too much on government and NGO. Private sector needs more attention specially for ESCO model development.
- Local RE providers do not profit enough as money is spend with international consultants and companies
- Development Banks increase finance cost by involving local banks and allow them to profit from it
- Long term development projects seem to focus to much on studies. Implementation is needed.

International Stakeholders

- Project development for international grant funding is often complicated, it takes a long time before a decision is made and it takes a long time before resources are made available.
- Project goals often are set to high and this eliminates good viable projects. More flexibility is needed.
- Because of this only financial strong companies can possibly benefit that often come from outside the region. It is important that local RE implementation companies get more support to insure a strong future RE industry in the region.

Overall recommendations

- Create more awareness how RE & EE is needed to reduce energy cost. Specially for business.
- Finally create an enabling environment that allows the use of RE and aggressively reduces payback.
- Focus on implementation instead of research. It is not important if a project pays for itself within 8 or 9 years for instance on a period of 25 years. Important is that it significantly reduces / stabilizes the risks of energy price inflation and that it works.
- Think long term instead of short term

Overall recommendations

- Keep project objectives simple.
- Try not to reinvent the wheel.
- Make sure upfront that the project can be financed and that the political will to implement is present.
- Ensure guarantees, choose a reliable technology provider that has a proven track record.
- Keep the project development team compact but knowledgeable.
- Ensure that technology can be duplicated and local technology transfer (jobs) is created.

Overall recommendations

Focus on significant Light House Projects that clearly demonstrate the use of the technology implemented in a day by day situation.

Stimulate the use of ESCO projects to overcome the financial challenges involved.

All Stakeholders need each other



-  Government
-  Public & Private Investors
-  Financial Institutions
-  International Stakeholders



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