“Implementation of a Building Integrated Photovoltaic in Urban Lands Using the Geospatial Technology”

Developed by: 

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summary

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02/06/2011
Introduction:

Background

Need of renewable energy

Global Warming

Global energy lack crisis

Demand of fossil fuel energy

Global Population

Global Population

Introduction:

Problem Statement

The impact of PV on the environment

estimate the effectiveness

Monitor and manage the use of PV technology

Interest in solar energy

Encourage the large public

Marketing Tools
**Introduction:**

*Primary objectives*

**Desicions makers**
- Best production of electrical energy;
- Management and control of use of solar panels

**Environment**
- Implantation of solar panels in urban areas while respecting the environment;

**Eco-friendly locations to implement BIPV**
- To classify the urban land cover of Johor Bahru City.
- To determine temperature for each land cover classes.
- To create a program to allow determine daily eco-friendly locations to implement photovoltaic.

**website to diffuse the results of objectives (1 and 2)**
- To quantify solar energy received per day;
- To simulate electrical energy;
- To manage and control the implantation of PV in eco-friendly locations;
- Receive monthly average report about the summation of energy producing;
- Encourage general public to adopt PV.

**Peninsular Malaysia**
- Automatically generate solar radiation maps
- To automate (Tovar, et al., 2000)'s algorithm;
- To generate daily solar energy maps from NOAA AVHRR;
- To estimate photovoltaic installation output.

**Johor Bahru**
- To generate daily solar energy maps from NOAA AVHRR;
- To estimate photovoltaic installation output.

**PM + JB**
- To classify the urban land cover of Johor Bahru City.
- To determine temperature for each land cover classes.
- To create a program to allow determine daily eco-friendly locations to implement photovoltaic.

**Aim & Objectives**

- Quantify solar energy received per day;
- Simulate electrical energy;
- Manage and Control the implantation of PV in eco-friendly locations;
- Receive monthly average report about the summation of energy producing;
- Encourage general public to adopt PV.
**Introduction:**

*Area of study*

- Peninsular Malaysia
- City of Johor Bahru

**Methodology:**

- **Remote sensing**
  - Envi, PCI, Matlab.
  - First part
  - Mapping of received solar energy
  - Second part
  - Mapping of environmentally areas for the location of solar panels

- **Web Mapping**
  - MapServer, PHP, Javascript, MySQL...
  - Third part
  - Creating a website for managing the use of PV based on the results of Remote Sensing part ()..
First Part
Mapping of solar radiation

Methodology:
Solar Radiation mapping

1. Creation of automated program to generate solar radiation maps.
   - PCI Software process
2. Creation of solar radiation maps based on the last program.
   - NOAA AVHRR satellite images, February 2010.
3. PV installation benefit.
   - Matlab Software
   - Solar cells efficiencies

Fig6: Main Framework
Part Two
mapping eco-friendly areas

Eco-friendly locations
Flowchart to determine eco-friendly locations

2/06/2011
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Part Three
Web Mapping Application

METHODOLOGY
Results and Analysis

Estimated daily solar radiation maps

FIG Working Week 2011
Bridging the Gap between Cultures
Marrakech, Morocco, 18-22 May 2011
Global Solar Radiation Average in the first eighteen days in February 2010

Land surface temperature map (Building) of Johor Bahru city, 2005
Maps of BIPV LST

The map of BIPV LST average, 60 w
The area in white color represents the non eco-friendly locations which has a temperature more than the threshold; 32 °C, this area represents 8.64% of all Johor Bahru and 48.8% of building area.

Eco-friendly locations to replace 100% roof building by Solar Panels (JBCC)

Optimal % of roof building where Solar Panels can be installed in eco-friendly manner (JBCC)
Results

**Table of Results**

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**Cell Efficiency**

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FIG Working Week 2011
Bridging the Gap between Cultures
Marrakech, Morocco, 18-22 May 2011
Conclusion

- Monitor and assess the existing PV network;
- Supervise the Eco-friendly installation of PV;
- Quantify the Solar Energy Received and the electrical energy produced (time, space);
- Keep a record of produced energy (time);
- Monitor the performance of the PV;
- Access to useful and quantitative information on PV benefits in the nearby;
- Assess the Eco-friendly possibility of installing PV pannels;
- Estimate the Solar Energy and potential electrical production and its equivalent in RM for a given period of time (in his/her location);
- Support to decide on installing or not PV;
- Promote and enhance the awareness on PV advantages.
• Thank you for your attention