



# Solar Thermal Utilization in Thailand

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Mr. Somsak Chutanan

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# European Commission Small Project Facility



- Title "Market Development for Solar Thermal Applications in Thailand (SolTherm Thailand)
- Funded by European Union Small Projects Facility
- Duration : May 2006 – April 2007
- Partner : Joint Graduated School of Energy Environmental (JGSEE)
  - : International Institute of Energy Conservation (IIEC)
  - : Fraunhofer Institute of Solar Energy Systems (ISE)



# Market Issues



Barrier	Actions
1. High upfront cost	<ul style="list-style-type: none"> <li>- Government Subsidy</li> <li>- Tax Rebate</li> <li>- Local Production</li> </ul>
2. Low awareness	<ul style="list-style-type: none"> <li>- Government Road Show</li> </ul>
3. Limit Experienced	<ul style="list-style-type: none"> <li>- Training</li> </ul>
4. Lack of standards, certification and quality labels	<ul style="list-style-type: none"> <li>- Installation Code</li> <li>- Label Program</li> <li>- Testing Facility</li> </ul>



# Potential Market

Sectors	Number of Unit	Collector area (m <sup>2</sup> )
Residential (3%)	450,000	900,000
Commercial – Hotel	3,500 Hotels	350,000
Commercial – Hospital	1,400 Hospitals	150,000
Industry – Food	106 Factories	100,000
Industry – Textile	409 Factories	300,000
Industry – Ceramics	255 Factories	100,000
Industry – Other preheat process		400,000
Total		2,350,000



## Government Subsidy Program

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Target	2007	2008	2009	2010	2011	Total
Solar Collector (SQ.M/yr.)	-	5,000	7,500	10,000	17,500	40,000
Value (M\$B/yr.)	6.00	37.50	48.75	67.50	101.25	261.00
Government Hospital	-	-	10	20	30	60
Value (M\$B/yr.)	-	-	10.00	20.00	30.00	60.00
Co <sub>2</sub> Reduction (Ton/yr.)	-	1,600	2,400	3,200	5,600	12,800
Feasibility Study	50	100	100	200	350	800

# Government Study 2007



## Naresuan University

Province	Customer	Business
Chiang-mai BKK	Chiang-mai Gate	Hotel
	Amora Tha-Pae	"
	Chiang-mai Plaza	"
	Holiday Inn Chiang-mai	"
	Chiang-mai Ram	Hospital
Chiang Rai	Kasem-Ratch Sriburin	"
Prae	Prae	"
Pitsanulok	Pitsanuwetch	"
Lampoon	Pampoon	"
Khonkean	Khonkean	"
	Khonkean-Ram	"
	Kosa Khonkean	Hotel
	Khonkean Hotel	"
Loi-ed	Saket Nakhon	"
	Loi-ed City	"
Khalasin	Khalasin	Hospital
	Rimpao	Hotel
Sri-saket	Srisaket	Hospital
	Brahm-piman	Hotel
Buriram	Buriral	Hospital
Udonthani	Udonthani	"
Mukdahan	Mukdahan Grand Hotel	Hotel
Ubolratchathani	Ubonrak Thonburi	Hospital

## King Mongkut's University

Province	Customer	Business
Nakhon-Panom	Nakhon-Panom	Hotel
	Nakhon-Panom River View	"
BKK	Nakhonthon	Hospital
	BNH	"
	Chareonkrung Pracharuk	"
	Klang	"
	Royal Princess Srinakharint	Hotel
	Imperial Queenspark	"
	Amari Atriam	"
	Pathumwan Princess	"
	Intercontinental	"
Pranakhon Sri-Ayuthaya	Perrier Vitel (Thailand)	Industrial
	Capsule Jel	"
Saraburi	Nam Sanitary	"
Ratchaburi	Textiles Satin	"
Nakhon-Prathom	Nakhonratchasri Industrial	"
Samut-Sakhon	Mahachai Food Processing	"
Nonthaburi	Advantage Footwear	"
Pra-juab Kiri-khan	Air-force Accommodation (Bo-Fai)	Residence
Rayong	Mahakij Bubber	Industrial
Chonburi	Chonburi Somdejprasankharajyanasungwon	Hospital
	Center for Retirement	"
	Dusit Resort Pattaya Lem-chabung Internation	Hotel
	Country Club	"
Surat-Thani	Pha-Nganchai	"
	Had-Kuad Resort	"
Kra-bi	Grand Beach Resort	"

# List of Approved Projects

No.	The Company Name	Sq.m. Installed	Total Subsidy
1	Nantra Construction (Chiangmai) Co.,Ltd.	84.600	380,700
2	Jasmine Resort Sri-Raja Co.,Ltd.	156.000	702,000
3	Tawee Ngern-thong Co.,Ltd.	72.150	324,675
4	Nanyang Textile Industrial Co.,Ltd.*	500.000	2,250,000
5	Mae Bua-sri Local Group	493.500	2,220,750
6	Thai Ruamsin Industrial Development Co.,Ltd.	462.000	2,079,000
7	Thai-Chinese International School	291.000	1,309,500
8	Royal Orchid Sheraton Travel Hotel	357.120	1,607,040
9	Bhum-prai Co. (Apai-Bhubeth Herbal Center)	493.500	2,220,750
10	Kittimol Co. (Niramol Villa)	155.100	697,950
11	Sunshine Beach Resort Co.,Ltd.	117.000	526,500
12	Ubol Development Co.,Ltd. (Ubol Hotel)	104.160	468,720
13	Anatasila Co. Ltd.	40.920	184,140
14	Whale Hotel Co.,Ltd.	319.920	1,439,640
15	Burapha Petchabune Hotel Co.,Ltd.	130.200	585,900
16	Yutthaporn Development Co.,Ltd. (King Park Avenue Hotel)	135.800	611,100
17	Buddhashinarat Phitsanulok Hospital	58.200	261,900
18	Asia Jumbo Co.,Ltd.	268.550	1,208,475
19	Thai Union Chemical Co.,Ltd.	282.900	1,273,050
20	Maharaj Nakhonraj Chiangmai Hospital	225.600	1,015,200
21	Mae Bua-sri Group Rubber Processing	251.780	1,133,010
Total		5,000	22,500,000

# Founder Members



PRO SOLAR GROUP CO., LTD.







# Objectives

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1. Point of contact for Government
2. Provide information of Solar Thermal Activities
3. Set up product standard
4. Build up local industry
5. Develop Solar Thermal Technology
6. Reduce country energy consumption

# 2009 Plan

- Support Government Subsidy Program
- Set up standard safety regulation
- Build up database for future development plan
- Training qualified persons for the industry
- Research & Development
- Expand membership to increase the association activities



# GTZ – Solar Heat in Agro-industry Process Project



- **Objective:** To develop solar thermal industry in Thailand at the technical and policy level with adaptation to the Thai context. The project will target to large scale applications particularly in the agro industrial process heat.
- **Timeframe:** 3 years
- **Budget:** ~ 10,000,000 baht
- **Current status:** Project concept note propose to the management
- **Expected start date:** Early 2009



## GTZ-Proposed STA Activities

- Trade Fair + Study Tour in Germany
  - Estec 2009 25-26 May 2009 (Solar Thermal)
  - Intersolar 27-29 May 2009 (PV conference / Solar trade Fair)
- Registration of ISES Thai National Section
- Seminar and Roadshow (Min 2 times / year)
- Trainings
  - Training for Installers (3 times)
    - Design of system
    - Operation and maintenance
    - General understanding
  - Training for Fabricator



## Standards and Labeling Program

### Testing facilities in Thailand:

- Naresuan University testing facilities
- KMUTT has a test stand for testing to ASHRAE standards
- AIT Energy park provides commercial performance testing service for SWH (CEERD 1998)

### Summary:

- National standards developed since more than 10 years, but not used
- Existing test facilities are partly functioning

New testing facility will be built by the Government to test the performance of the products available in the market



**COLLECTOR TESTING**

## Local components available

SWH Component/Accessories	Domestic Manufacturers	Domestic Fabricators	Import
Solar Collector		Yes	Yes
Evacuated Tubes			Yes
Tempered Glass (For Solar Collector)	Yes		
Copper Tubing / Piping	Yes		Yes
GI Piping	Yes		
Plastic Piping	Yes		
Stainless Steel Piping	Yes		Yes
Insulation	Yes		Yes
Small Storage Tank (< 600 Liters)		Yes	Yes
Large Storage Tank (> 600 Liters)		Yes	
Circulation Pump	Yes		Yes
Valves & Gauges	Yes		Yes
Differential Temperature Sensor, Electrical Apparatus & Other Controllers		Yes	Yes



## Benefits to local economy

For every 10,000 sq.m.  
of solar thermal system  
installed

- Create local jobs – up to 700
- Reduction of import fuel – up to 2 kote per
- CO<sub>2</sub> reduction – 3,200 tons





Thank you for your attention

