

**Regional Workshop
for the Transformation and Strengthening of
the Solar Water Heating in Latin American and The Caribbean**

July 2011



Table of Contents:

Introduction.....	1
Workshop objectives and achievements.....	2
Agenda.....	2
Main topics discussed.....	3
Participants.....	9
Conclusions.....	10
Future actions.....	11
Anex A.....	12
Anex B.....	16
Anex C.....	18
Anex D.....	20

Introduction

Funded by the Global Environment Fund (GEF), the “Global Solar Water Heating Market Transformation and Strengthening Initiative” (Global Solar Water Heating: GSWH project), is now being jointly implemented by the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) since 2009. The project’s goal is to accelerate the global commercialization and sustainable market transformation of solar water heaters (SWH), thereby reducing the current use of electricity and fossil fuels for hot water preparation. It builds on the encouraging market development rates already achieved in some GEF programme countries and seeks to further expand the market in other countries with good SWH potential where the prerequisites for market uptake appear to exist. UNEP’s primary contribution to the project has been the global knowledge management component. UNEP is implementing the knowledge management component in close cooperation with the International Copper Association (ICA) and four other regional partners, Observatoire Méditerranéen de l’Energie (OME), Latin American Energy Organization (OLADE), European Solar Thermal Industry Federation (ESTIF), and the International Institute for Energy Conservation (IIEC).

In the past two years, there have been good practices and lessons learnt achieved during the project implementation. This knowledge is now being shared on the global and regional levels under the project’s global knowledge management component. In this manner, the projects seeks to create a platform for knowledge sharing and collaboration to transfer and scale up the solar thermal heating market for, both, public and private sectors respectively in Latin America and the Caribbean, and it also seeks to envision a global and regional network. In order to such ends, the Latin American Energy Organization (OLADE), the project's regional partner, worked together with the Ministry of Energy of Chile, to organize the Regional Workshop of Solar Thermal Energy. This event took place from the 22nd until the 23rd of June, 2011 in the city of Santiago, Chile in the Hotel Intercontinental. The main goals of the workshop were to review the progress of the Global Solar Water Heating (GSWH) project; introduce the status of the GSWH project implementation in Mexico and Chile, and; share the best practices and build up the networking.

Workshop objectives and achievements:

The workshop created a platform for knowledge sharing and collaboration to transfer and scale up the solar thermal heating market for, both, public and private sectors respectively in Latin America and the Caribbean, and was able to create (as envisioned) a global and regional network through the following activities that were achieved during the workshop:

- Inform about the Global Solar Water Heating (GSWH) project's goals and objectives: Introduce the (GSWH) project's goals and objectives to the participating regional countries and present the global knowledge management web site of the project, review the progress of project implementation, as well as present some technical thematic areas of common interest.
- Inform about the status of the GSWH project implementation in Mexico and Chile: Update the current status and progress of the Solar Water Heating market in each of the regional project countries (Mexico and Chile) and the level of progress with the national activities in both countries.
- Share the best practices and build up a regional network: Provide the opportunity for policy makers and businesses for cross-country discussions and deliberations so that they can learn from each other's successes and failures, and identify areas for collaboration on the national, regional and global levels.

Agenda:

Attached in Annex A is the agenda of the workshop.

Main topics discussed:

Five main topics were discussed and that included the following:

1 Overview of the “Global Solar Water Heating Transformation and Strengthening Initiative” (GSWH): In this section, several project partners presented the regional and global components of the project, the financial mechanisms, the actors involved and the expected results. A brief summary of the session is outlined below:



Presentation by **Amr Abdel Hai**
Programme Officer,
UNEP, Energy Branch

The presentation of Amr Abdel Hai (Programme Officer of UNEP) sought to provide an overview of the global component under the project. Thus, as mentioned by Mr. Abdel Hai, the GSWH project has a global geographical scope and it is planned to last for 60 months, being the starting date May 2009. The main objective of this project, as highlighted before, is to accelerate global commercialization and sustainable market transformation of solar water heating, thereby reducing the current use of electricity and fossil fuels for hot water preparation in residential, private service sector and public building and, when applicable, industrial applications. With this objective, the expected impacts are: installation of an additional million square meters of SWH panels by the end of the country programs; reduction of 14.9 million tons of CO₂ (green house gases) over 15 years; and growth of a sustainable market at a minimum annual rate of 20% (in total installed capacity).

The two main components of this project are: 1) Global Knowledge Management and Financial Mechanisms Component; and 2) Country Programs Component in Albania, Chile, Lebanon, India and Mexico. The first component has several elements: the Knowledge Products and Services, Knowledge Dissemination, the Knowledge Enhancement, and the Knowledge Management System, which it entails a web-based tool (www.solarthermal.org). The second component, which comprises the project partners, seeks to collect information such as lessons learned and case studies; and create innovative products such as technical and market assessments, solar thermal sizing and modeling tools; and dissemination and training through regional workshops and e-learning activities.

Also, Mr. Amr Abdel Hai outlined, UNEP’s goal is to improve the knowledge sharing on which today’s energy planning is done by the public and private sectors, in particular regarding new approaches to accelerate sustainable market transformation of solar water heating.



Presentation by **Mario Lionetti**
Programme Officer,
UNEP, Energy Branch

The presentation by Mario Lionetti (Programme Officer of UNEP) sought to provide a summary of the financial support mechanisms that are necessary to develop a solar thermal market, and he also outlined what is the role of UNEP in enhancing and developing these mechanisms in several countries. As mentioned by Mr. Lionetti, UNEP's vision is to catalyze the creation of the sustainable energy finance industry. Therefore, UNEP works directly with the finance industry to make investment happen; meaning that this institution will not provide finance for projects but instead it will encourage national financing institutions to do so. A success story mentioned by the panelist has been PROSOL in Tunisia. PROSOL is a financing support mechanism, which has sought to create credit facilities using the state utility as a channel for recovering the loans through utility bills; helps local banks build loan portfolios for renewable energy projects by implementing an interest rate subsidy; provides to the end user a capital cost subsidy to partially reduce the SWH financing; among others.



Presentation by **Judy Li**
Technical Specialist,
UNEP,

Climate Change Mitigation, Environment and Energy Group

The presentation of Judy Li (Programme Officer in UNDP) sought to provide a summary of Phase I of the GSWH, which comprises the project's programme in five countries (Albania, Chile, India, Lebanon, Mexico). As mentioned by Judy Li, this initiative is funded by GEF and it was approved in August 2008 with a total funding of US \$ 36 million. The target of the first phase is the installation of 3 million square meters of SWH panels and growth of a sustainable market at the minimum rate of 20% (in total installed capacity) by the completion of the project. Several activities and tasks have been completed in order to meet this goal; however, throughout the project several barriers have been encountered in each country, as outlined in the presentation (for more information, go to this website: www.olade.org/energia-solar-termica). There are several common barriers that are found in most of the above-mentioned countries, such as a lack of a strong legal and institutional framework to develop the solar water heating market; lack of quality control and certification; lack of awareness; lack of financial and fiscal incentives; among others.



Presentation by **Nigel Cotton**
Technical Regional Adviser,
ICA



Presentation by **Eduardo Noboa**
Coordinator of Renewable Energy and Environment,
OLADE

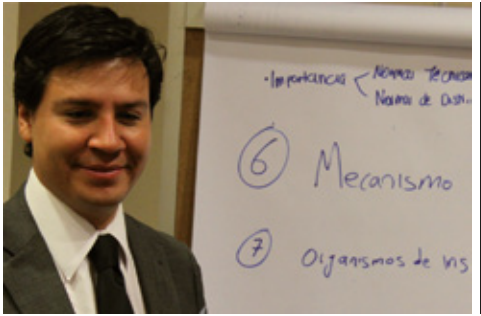
The presentation of Nigel Cotton (Technical Regional Adviser in ICA) sought to provide a brief summary of the Knowledge Management website (www.solarthermal.org), which seeks to foster successful market growth in the solar thermal sector; create a worldwide forum for experts on solar thermal technology; boost the use and investment on solar thermal energy; among others. For more information regarding the website, see the presentation in the following link www.olade.org/energia-solar-termica.

The presentation of Eduardo Noboa (Coordinator of Renewable Energy and Environment in OLADE) sought to provide a general overview of the status quo of the solar water heating market and support frameworks (institutional and legal) in six countries of Latin America and the Caribbean (Argentina, Barbados, Brazil, Colombia, Nicaragua and Peru). Moreover, Mr. Noboa outlined several barriers that exist in these countries and thus act as an impediment to encourage the development of the solar water heating market. Some of these barriers that could be found in several of these countries are: lack of a comprehensive legal and institutional framework, in exception in the case of Brazil and Barbados; lack of quality norms and certifications, in exception of Brazil and Peru; lack of human capacity to fabricate and install solar thermal panels; among others. In his presentation, several priorities of action were mentioned for each country. In order to have more information regarding each country, see www.olade.org/energia-solar-termica.



Presentation by **Xavier Noyon**
Executive Secretary,
ESTIF

The presentation of Xavier Noyon (Executive Secretary in ESTIF) sought to provide an overview of the guidelines and best practices concerning the policy framework; awareness raising and promotion campaigns. As mentioned by the panelist, the main pillars for a strong solar water heating market is a holistic policy framework which can regulate and control the private and public institutions involved in this sector; awareness and promotion campaigns so that the population can understand and be aware of the economic, social and political benefits of developing this market.



Presentation by **Edgar Marín**
National Coordinator of GSWH in Mexico

The presentation of Edgar Marín (National Coordinator of GSWH in Mexico) sought to provide a general overview of the status quo of the national project in Mexico, the activities undertaken, results, goals, among others. As mentioned by the panelist, the objectives of the national project in Mexico is to accelerate and guarantee a sustainable increasing rate of 14% (total installed capacity); install 2,500,000 m² solar water heaters by the end of 2013. This will entail to increase the participation of solar water heaters in the residential sector up to 14%; develop a regulatory framework; increase the demand rate; among others. This project started in 2005 and will continue until 2013. Since the starting date of the initiative, several activities, tasks and goals have been completed. Also, the panelist mentions that there were several barriers encountered during the execution process of the project, and some of these are: there are no dissemination initiatives to promote the use of this technology, there is variety of equipment that are imported from China that do not meet the standards, the national framework has not been aligned according to the ISO norms, among others. To see more information regarding this presentation, see www.olade.org/energia-solar-termica.



Presentation by **Emilio Rauld**
National Coordination of the GSWH in Chile

The presentation of Emilio Rauld (National Coordinator of the GSWH in Chile) sought to provide an overview of the status quo of the project in Chile, the activities undertaken, results, among others. As mentioned by the panelist, the project has four main elements and these are: elaboration of norms, standards and systems of certification; awareness programs for information dissemination and training, visits to several communities, etc.; preparation of human capacity for professional and technical matters; financing solutions and proposals to have a more appealing market for the consumer. In order to carry out these goals and activities of the initiative, professionals from the Ministry of Energy, the Centre of Renewable Energy in Chile, the Foment Corporation, and from PNUD are working on this project. As a result of this initiative, several solar water heaters have been installed in Chile. In the year 2008, there was a total installation of 7,094 SWH and in the years 2009-2010 a total of 7,937 SWH were installed. Moreover, there has been an effective communication and diffusion campaign considering that a new website was elaborated (www.programasolar.cl) for Chile and until the day of the conference there were 26,000 visits and more than 9,000 downloads of the documents, and 1,500 download of the solar water heating manual elaborated by the project managers. There have been several other results from this program, for a more detailed summary of the results information see www.olade.org/energia-solar-termica.

- 2 The importance of a structured solar thermal industry:** In this section, the principal requirement of a structured solar thermal industry is an association, through which normalization programs, promotion campaigns, formalization and certification programs can be undertaken.

Presentation by **Xavier Noyon**
Executive Secretary in ESTIF

The presentation by Xavier Noyon (Executive Secretary in ESTIF) sought to highlight the importance of a structured solar thermal industry in order to encourage the development of such market. As mentioned by the panelist, this structuring can happen in many ways such as in associations. In this way, all the actors of the value chain (manufacturers, distributors, importers, resellers, installers, planning and design, test labels, certifiers, maintenance and others) are represented with one voice; this association can promote awareness programs, information dissemination, capacitation of human capacity; it can also create pressure on the government in order to change the policy and regulatory framework; create standardizations and quality norms, among others. In the case of Europe, the associations (especially ESTIF) have worked in a positive manner for the development of such market. For more information regarding this matter, see www.olade.org/energia-solar-termica.

- 3 The role of public policies, regulations, programs and an institutional framework for market development of solar water heaters in Latin America and the Caribbean:** In this section, representatives of several countries (Argentina, Barbados, Brazil, Colombia, Nicaragua, Peru, Uruguay) gave a presentation regarding the status quo of the market and the support frameworks for the development of the solar thermal energy market for water heating in each country.

Presentation by **Country Representatives:**

For more information regarding the presentations of each country and the status quo of the policies and the market in the countries of Argentina, Barbados, Brazil, Colombia, Nicaragua, Peru, see Annex D and the following link www.olade.org/energia-solar-termica.

- 4 Benefits of solar thermal energy:** In this section, it was analyzed and discussed the environmental, social, and economic benefits at the national, local and/or regional level if a solar water heating market is to be developed.

Presentation by **Xavier Noyon**
Executive Secretary in ESTIF

The presentation by Xavier Noyon (Executive Secretary in ESTIF) sought to highlight the benefits of a solar thermal industry. As mentioned by the panelist, if a solar water heating market is developed there are economic, social and environmental benefits at the national, local and at the regional levels. On the economic aspect, an industry is created and/or strengthened by creating jobs, incentivizing the economy and others. On the social aspect, with the development of the solar water heating market, isolated communities that do not have access to natural gas and/or electricity to heat water can now have access, thus improving the living conditions of the poor sectors of the population. On the environmental aspect, if there is a reduction of conventional energy sources for water heating, then there is a reduction of CO2 emissions.

5 Standardization and quality assurance of solar thermal panels: In this section, it was analyzed and discussed the importance of standardization and quality standards of solar thermal systems, and how these components are key to ensure the development of this market; the entrance of new actors and how this helps builds trust along the value chain.



Presentation by **Harald Drueck**
International Consultant

The presentation of Harald Drueck (International Consultant) sought to highlight that the main components of a solar thermal industry are standardization and quality assurance. As mentioned by the panelist, first, there is the need to set up testing laboratories and/or centers in countries where there are none in order to have certified solar water heaters. Second, there is the need to elaborate and implement standards, and quality norms and certification procedures for installers and manufacturers. In this manner, an industry can develop and emerge with no setbacks. Moreover, as mentioned by the panelist, Europe has several testing and certifications facilities, and several standards and certifications programs. The region of Latin America and the Caribbean can use these norms and standards as an example and modify them to the needs and conditions of every country. For more information regarding the European certification norms and standards, see www.olade.org/energia-solar-termica.

Participants:

There were several participants at the workshop:

Representatives of the public and private sectors were invited from 9 countries of Latin America and the Caribbean (Argentina, Barbados, Brazil, Chile, Colombia, Ecuador, Mexico, Nicaragua, Peru, and Uruguay).

Project's national partners in both Mexico and Chile.

International experts of several institutions: International Copper Association (ICA), United Nations Development Program (UNDP), United Nations Environmental Program (UNEP), and from the European Solar Thermal Industry Federation (ESTIF).

In Annex B is the list of all participants with their contact information.

Evaluation of the workshop:

An evaluation questionnaire was handed out at the end of the workshop and the average results are presented in the table below:

Organization and logistics	Very Good
Structure and content	Very Good
Networking	Very Good
Lessons learned	Very Good
Future actions	Very Good

Regarding the issues of organization and logistics, about 78% of participants thought this was very good, 18% thought it was good and about 2% thought it was regular.

In terms of lessons learned, about 61% of participants felt that these were very good, 30% thought they were good and about 10% thought they were regular.

With regards to future actions, about 80% of participants think that it is important to create a regional or sub-regional association that unites all the actors of the solar water heating sector; 61% of participants think that it is important to create regional or sub-regional technical laboratories; 66% of participants think that it is important to create regional or sub-regional standards and technical norms; 87% think that it is important to undertake this type of regional workshops annually and around 78% of participants thought that it is important to create a solar thermal energy network which is initially conformed by the participants of this workshop.

Conclusions:

The participants recognized the need to have a regional platform which would facilitate the transfer of knowledge and information in the solar thermal sector and in this manner to incentivize the restructuring of the industry, local capacity building and the establishment of testing facilities.

The possibility of creating a sub-regional market according to the bioclimatic zones of the region was discussed. It was suggested that each bioclimatic zone would have each its own quality and testing standards in terms of manufacture, components and installation. According to this idea, each bioclimatic zone would have its set of norms and certification laboratories and inspection bodies.

There are several success stories of the public and private partnerships/synergies and the creation of associations or organizations in the development of the SWH industry market due to the integration of several actors (public and private companies, universities, laboratories, government agencies, among others) through these mechanisms. An example of this success is the association Mesa Solar in Uruguay. This association entails several private, public, academic entities, and others, such as the Association of Thermal Installers, Association of Small and Medium Enterprises, private consultants, Faculty of Architecture of the University of Uruguay, Association of Engineers of Uruguay, Association of Thermal Conditioning of Uruguay, among others. Due to this public and private partnership among several organizations, it has created a platform for promoting solar thermal energy within the country and it has had a tremendous success. Due to this Mesa Solar, the solar water heating market in Uruguay has developed tremendously, considering that this organization focuses in developing a legal framework, creating human capacity through education, providing the private sector (projects, investors, and installers, among others) with technological and knowledge support.

The benefits of using solar thermal energy and the importance of disseminating these benefits through awareness campaigns were discussed and identified. The benefits that were identified were economic, social, and environmental.

On the economic front, there is the creation of new industries at the national level. If the demand of solar water heaters increases, then there is opportunity for the distributors, fabricators, importers and other key actors of the value chain of SWH to grow and for the industry to consequently grow.

On the social front, as a result of a new industry emerging, there are more job opportunities at the local and national levels. This, indirectly, improves the living conditions of the population.

On the environmental front, there is a reduction of green house gases (GHG) emissions considering that the use of conventional energy sources such as natural gas and electricity is reduced in exchange of alternative energy sources.

On the political-economic front, the region and/or countries can benefit from energy independence. Countries that need to import electricity and/or natural gas such as Barbados benefit from developing this market considering that the country no longer has to depend on imports.

In Annex C, there is more information regarding the findings of the working groups. Basically all the working groups came to the conclusion that the institutional and legal framework of every country will need to be developed and/or strengthened; there is the need to develop certification norms and quality standards at the same time that certification laboratories are established; the solar water heating market has several economic, social, environmental and political benefits; and a regional or sub-regional market can be developed in Latin America and the Caribbean. Annex C provides more information regarding these findings.

Annex D presents a summary of each participating country, including the barriers faced by countries in the development of the solar water heating market and the potential priorities of actions that are recommended for countries in order to develop such market.

Future actions:

The next step is to identify countries or sub-regions with political will and a high potential for solar thermal market development for water heating, which will be willing to undertake the necessary regulatory and institutional changes and thus achieve such end of developing this market. Once these countries are identified, suggestions will be elaborated for the implementation of national programs.

From the participating countries in the workshop, those that have showed a high potential and political will for the development of the solar water heating market are: Nicaragua, Uruguay, Ecuador and Colombia.

Also, the idea of creating a sub-regional market according to bio-climatic zones can also be evaluated. These bio-climatic zones would have quality testing standards in terms of manufacture, components and installation at the regional level, and that will help enhance product quality by harmonization of the standards and certification schemes. The development of the certification scheme will normally imply a procedure to guarantee the evaluation of conformity of the supplier. The project can play a major role in assisting in the development of such a scheme in collaboration with local institutes and parties. Furthermore, it can play a facilitating role in the implementation and adoption of the certification scheme, related labelling and surveillance structure at the national and regional levels by strengthening institutional capacity and testing facilities.



UNEP/ UNDP / OLADE / GEF / ICA
Global Solar Water Heating Market Transformation and Strengthening Initiative

**Regional Workshop for the Transformation and Strengthening of the Solar
Water Heating Market in Latin America and the Caribbean**

22-23 June, 2011
Santiago, Chile

Agenda

Day One – Wednesday, 22 June 2011

8:30 – 9:00 ***Registration***

9:00 – 10:30 ***Opening Session***

- Opening remarks by Miguel Perez de Arce Jeria, Head of the Division ERNC, Ministry of Energy, Chile.
- Opening remarks by Amr Abdelhai, Programme Officer, Energy Branch, United Nations Environment Programme (UNEP), France.
- Opening remarks by Eduardo Noboa, delegate of the Executive Secretary of the Latin American Energy Organization (OLADE), Ecuador.
- Opening remarks by Judy Li, Technical Specialist, Climate Change Mitigation, Environment and Energy Group, United Nations Development Programme (UNEP), United States.
- Opening remarks by Nigel Cotton, Technical Regional Adviser, International Copper Association (ICA), Belgium.

10:30 – 11:00 ***Coffee Break***

11:00 – 13:00 ***Session I: Overview of the “Global Solar Water Heating Transformation and Strengthening Initiative” (GSWH Project- Global, Regional and National Components of the project)***

Overview of the GSWH Project:

- Amr Abdelhai, Programme Officer, Energy Branch, UNEP, France - Overview of the global component of the project.
- Mario Lionetti, Programme Officer, Energy Branch, UNEP, France - Financial support mechanism for solar thermal applications.
- Judy Li, Technical Specialist, Climate Change Mitigation, UNDP, U.S.A.- Summary of each of the project’s programme in five countries.



Global and Regional Project Partners Presentations (ICA –OLADE- ESTIF):

Nigel Cotton. Technical Regional Adviser, ICA, Belgium.- Introduction to the Global Knowledge Management web-site with the five thematic areas and expected links with regional countries.

Eduardo Noboa, Coordinator of Renewable Energy Sources and Environment, OLADE, Ecuador - General description of the regional project: objectives, activities, products, results and future actions.

Xavier Noyon, Executive Secretary, European Solar Thermal Industry Federation (ESTIF), Belgium – Guidelines and best practices concerning the policy framework; awareness raising and promotion campaigns

Regional Project Country Presentations (Chile – Mexico):

- Edgar Marín, National Coordinator of the GSWH Project in Mexico, UNDP, Mexico– General description of the National Project in Mexico: objectives, activities, actors involved, results, lessons learnt and recommendations.
- Emilio Rauld, Coordinator of the Project, Solar Programme MINENERGIA/UNDP/GEF, Chile - General description of the National Project in Chile: objectives, activities, actors involved, results, lessons learnt and recommendations.

13:00 – 14:30 *Lunch*

14:30 – 15:15 **Session II:** The Importance of a Structured Solar Thermal Industry.

Presentation by Xavier Noyon, Executive Secretary, European Solar Thermal Industry Federation (ESTIF), Belgium.

Presentation Summary: The development of a given industry cannot be a process lead only by policy and public authorities. The whole value chain of the solar thermal industry from raw materials, to manufacturing distribution, installation maintenance, certification and testing must be organized in some form (trade associations, or other form of forum). A structured industry is necessary to understand and describe the conditions necessary to the development of the market and on this basis either communicate to public authorities to request their support or initiate autonomously the actions necessary. The structuring in form of trade associations is one example but the structuring of the industry is also valid in other forms: standardization bodies, industry promotion bodies, training and certification bodies, industry specific trade fairs and/or conferences.

15:15 – 15:45 *Coffee Break*

15:45 – 17:30 **Session III:** Working group regarding the subject of Session-II - The Importance of a Structured Solar Thermal Industry.

Moderator: Xavier Noyon

Facilitators: OLADE's representatives

18:30 – 19:30 *Cocktail*



Day Two – Thursday, 23 June 2011

8:55 – 9:00 Summary of the Activities of **Day One**

9:00 – 10:30 **Session IV:** The Latin American and Caribbean Perspective in Solar Water Heating: Public - Policies, Regulations, Programs and Institutional Frameworks (their role in the development of this sector)

- Carlos St. James, Director, Santiago & Sinclair, Argentina.
- Marlon Moore, Consultant, Solar Dynamics, Barbados.
- Elizabeth Marques Pereira, Brasil.
- Henry Josué Zapata, Professional of URE and Renewable Alternatives, Ministry of Energy and Mining, Colombia.
- Luis E. Manzano V., National Director of Renewable Energy, Ministry of Electricity and Renewable Energy, Ecuador.
- Rodolfo Raudez, General Manager of SUNI SOLAR S.A., Nicaragua.
- Abel Gutierrez, Executive President, THERMOSOL/TERMOINOX, Peru.
- Martin Scarone, Director of Renewable Energies, Direction of National Energy, Ministry of Industry, Energy and Mining, Uruguay.

Presentation Summary: In Latin America and the Caribbean, the development of a given industry, in this case of solar water heating, is a two-way process. On the one hand, there is the market role and its private actors who shape and strengthen the thermal solar energy industry. On the other hand, there is the government role and its public actors who also shape this industry through political initiatives which incentivize the development of such market. Therefore, in this session, the role of the public sector and of its functionaries will be revised, its gaps and barriers of the institutional and legal framework will be analyzed, the same as for the priorities for actions in order to help develop this industry.

10:30 – 11:15 **Session V:** What are the benefits of solar thermal at the national and regional levels?

Presentation by Xavier Noyon, Executive Secretary, European Solar Thermal Industry Federation (ESTIF), Belgium.

Presentation Summary: The GSWH project aims at triggering the deployment of solar thermal in target countries; why should policy makers decide to promote the development of solar thermal, what are the strategic, economical, societal, environmental benefits. A focus could be given on the economical side, especially taking into account the fact that these policies have costs.

Independence from fossil fuels imports (energy independence has also strategic benefits) generates costs savings and energy stability; this benefit is equally true at the level of a household and of the country. Solar thermal can also contribute to tackle energy poverty.

The value chain (economic value) generated by solar thermal is much wider than only the manufacturing of systems (distribution, planning, installation, maintenance), therefore even with imported systems there is a very significant impact on the local economy and the creation of local added value.

Solar thermal can contribute to the reduction of electricity consumption and thus it contributes to avoid unnecessary investment in electricity infrastructure.

Solar thermal is completely carbon free production of energy and solar thermal systems can be recycled at a low cost and locally.



The understanding of benefits needs to be adapted to a local context and it allows for the elaboration of priorities for the different audiences involved in the program (policy-Makers, industry and final consumers)

11:15 - 11:45 *Coffee Break*

11:45– 13:00 **Session VI:** Working Group regarding *Session IV* subject - Benefits of Solar Thermal

Moderator: Nigel Cotton (ICA) + Xavier Noyon (ESTIF)

Facilitators: OLADE's representatives

13:00 – 14:00 *Lunch*

14:00 -14:45 **Session VII:** Standardization and Quality Assurance in Solar Thermal (ST)

Presentation b Dr. Harald Drueck, International Consultant, Germany.

Presentation Summary: Standardization and quality are central components of the development of a sustainable ST market (or any manufactured product). They increase the potential market for products and their acceptance by the final consumers. They allow the elaboration and the implementation of safety/quality regulations. They guarantee the access to the market of new players and generate confidence all along the value chain. We will review the basic of standardization and quality for ST products, their elaboration, implementation and control. Which role for the administration, the industry, the laboratories, certification and standardization bodies?

14:45 -16:00 **Session VIII:** Working Group on *Session VII* subject – Standardization and Quality Assurance in Solar Thermal.

Moderator: Dr. Harald Drueck

Facilitator: OLADE's representatives

16:00 - *Site Visit to one of the SWH installations in Chile in Edificio Alto Serrano.*

Visit to a solar water heating installation in Edificio Alto Serrano for residential purposes. The total number of benefited residences is 486 and there are a total of 125 flat plate solar collectors installed. The total volume of hot water generated is approximately 28,000 liters per day.

B

Name Nombre	Last Name Apellido	Title Cargo	Institution Institución	Country País	Email
Amr	Abdel Hai	Oficial de Programa	UNEP	Francia	amr.abdelhai@unep.org
Juan	Altamiras	Representante	ICA /Procobre	Chile	jaltamiras@copper.org
Viviana	Avalos	Director Nacional de Programa Solar	Ministerio de Energia	Chile	vavalos@minenergia.cl
Francisco	Beckmann	Director	Soltec	Ecuador	beckmannfj@yahoo.es
Giacomo	Biancardi	Gerente General	Sical Ing	Chile	biancardi@sical.cl
Marcos	Brito	Profesional de Programa Solar	Ministerio de Energia	Chile	mbrito@minenergia.cl
Daniela	Burgos	Ing. de proyectos	CDT	Chile	dburgos@cdt.cl
Jesus	Castro		Ecoenergia / Chilectra	Chile	jacr@chilectra.cl
Carlos	Cerda	Jefe Unidad Colectores Solares	SEC	Chile	ccerda@sec.cl
Nigel	Cotton	Asesor Regional Técnico	ICA /Procobre	Belgica	ndc@eurocopper.org
Harald	Drueck	Experto Internacional	ITW/ ESTIF	Germany	drueck@itw.uni-stollgad.de
Jaime	Gonzalez	Jefe de Estudio	SEC	Chile	jgonzalezf@sec.cl
Hernan	Gonzalez	Profesional de Programa	UNDP	Chile	hernan.gonzalez@undp.org
Abel	Gutierrez	Gerente	TERMOINOX	Peru	abelcesar28@hotmail.com
Judy	Li	Especialista Técnica / Mitigación de Cambio Climático	UNDP	Estados Unidos	judy.li@undp.org
Marco	Lionetti	Oficial de Programa	UNEP / DTIE	Francia	mario.lionetti@unep.org
Marcelo	Lopez	Gerente General	ENERPETROL	Ecuador	marcelol@enerpetrol.com
Luis	Manzano	Director Nacional de Energía Renovable	Ministerio de Electricidad y Energia Renovable	Ecuador	luis.manzano@meer.gob.ec
Edgar	Marin	Coordinador Nacional del Proyecto GSWH	UNDP	Mexico	edgarmarin@undp.org
Elizabeth	Marques de Perez	Profesora	Centro Universitario UNA	Brasil	elizabeth.pereira@una.br
Marcelo	Mesquita	Gerente	Abrava	Brasil	gestor.dasol@abrava.org.br
Marlon	Moore	Consultor	Solar Dynamics	Barbados	marlonmoore15@gmail.com
Sebastian	Nicholls	Departamento Comercial	ENERPETROL	Ecuador	sebastiannicholls@hotmail.com
Eduardo	Noboa	Coordinador Renovables	OLADE	Ecuador	eduardo.noboa@olade.org

B

Name Nombre	Last Name Apellido	Title Cargo	Institution Institución	Country País	Email
Pablo	Pastene	Jefe de Division ERNC	Fundacion Chile	Chile	ppastene@fundacionchile.cl
Miguel	Perez de Arcia	Gerente General	Ministerio de Energia	Chile	mperezdearce@minenergia.cl
Rodolfo	Raudez	Coordinador	Suni Solar	Nicaragua	rodolfo.raudez@sunisolar.com
Emilio	Rauld	Co - Funding Manager	Ministerio de Energia	Chile	erauld@minenergia.cl
Rosario	Retamal	Constructor Civil	ICA /Procobre	Chile	rretamal@copper.org
Yoselin	Rozas		DITEC - MINVU	Chile	yrozas@minvu.cl
Claudia	Sanchez	Asesor	ICA /Procobre	Chile	claudia@procobre.cl
Martin	Scarone	Director	Dirección de Energía	Uruguay	martin.scarone@rne.miem.gub.uy
Carlos	St. James	Jefe laboratorio de	Santiago & Sinclair	Argentina	cstjames@santiagosinclair.com
Patricio	Urzua	ensayo CST y DA	Sical Ing	Chile	purzua@sical.cl
Andres	Velasquez	Gerente General	ASSYCE group	Chile	andres.velasquez@assyce.com
Francisco	Viada	Gerente General	DACLIMA	Chile	fviada@daclima.cl
Richard	Wendling	Division Solar Termica	GIE	Colombia	rwendling@gie.com.co
Julio	Yarza		Mesa Solar	Uruguay	julioyarza@yahoo.com.uy
Henry	Zapata	Profesional del URE y Fuentes Alternativas	UPME	Colombia	henry.zapata@upme.gov.co
Claudio	Gonzalez	Jefe de producto	SEC	Chile	jgonzalezf@sec.cl
Eduardo	Noboa	Coordinador de Energías Renovables	OLADE	Ecuador	eduardo.noboa@olade.org
Andrea	Salvador	Consultora del Proyecto Solar Térmica	OLADE	Ecuador	andrea.salvador@olade.org
Michelle	Maag	Consultora del Proyecto Solar Térmica	OLADE	Ecuador	—



Working Group 1:

A structured solar thermal industry is a crucial element to develop the market. Therefore, the participants discussed the possibility of standardizing the market according to bio-climatic regions and mentioned the possibility of homologating norms, certifications and laboratories in each of these regions, as well as creating human capacity for the fabrication and installation of solar water heaters in every bioclimatic region, and creating organisms of inspection. These are steps that are necessary in order to create a sub-regional market where solar water heaters could move freely.

There are several benefits if this market is developed. In the social-economic aspect, new industries and jobs are created at the local and regional levels. In the environmental aspect, there is a reduction of GHG emissions.



Working Group 2:

The experience of other countries could be useful for those countries that are starting to develop the market. The countries that are more advanced in the development of this industry could provide training and guidance to those markets that are starting to emerge.

In Latin America and the Caribbean there is the need to develop a regional market as in Europe through an association similar to ESTIF (European Solar Thermal Industry Federation).

In Latin America and the Caribbean the issue of standardization and certification is a new subject in the region. In Brazil such topic has been already implemented through the PBE labeling program and the Qualisol certification. In the case of Chile, such subject matter has recently been discussed and implemented with the Law 20.365, which seeks to establish certifications norms for solar water heaters, create certification and inspection organisms and also it seeks to create laboratories. In order to achieve a greater development in the certification and standardization issue at the regional level, there has to be more knowledge exchanging platforms/workshops in order to incentivize the development of the market and thus of the normative. Only, in this manner, a regional market can be developed and/or strengthened.

It is necessary to have a clear government policy in order to develop the solar water heating market.



Group 3:

In each country, the SWH market and the industry have developed and are organized in different manners. In the case of Barbados, there is an oligopoly considering that there are only few manufacturers of solar water heaters. Some of these are: Solar Dynamics, Aqua Sol, and SunPower. The first one mentioned is the strongest and the biggest fabricator within Barbados. This market has developed greatly and quickly despite the fact that there has not been any association. In the case of Uruguay, this market has developed due to an association (Mesa Solar), in which there are several stakeholders such as architects, fabricators of solar water heaters, and laboratories. In this association, these actors share information, knowledge and lobby with politicians so that the government can implement policy and programs that are beneficial for the SWH market in Chile.



Group 4:

Financial mechanisms are crucial in order for the solar water heating market to develop and these have to be implemented by the government. A few examples of financial mechanisms that have had a positive effect in some countries of Latin America and the Caribbean have been: loans for consumers to buy solar panels, taxes on conventional energy sources (electricity and natural gas), tax refund of the total cost of the solar system, tax reduction to the raw materials that are imported to fabricate solar systems.

Norms, certifications, quality standards and laboratories need to be created and/or enhanced within the region. Norms and standards from other regions such as from Europe, Asia, North America, and others, can be used as examples and as a guide for Latin American solar thermal experts and politicians, considering that these can be used as a base line and can be modified and adjusted to the reality of each country of the region. It is important to mention that not only manufacturing standards but also installation standards need to be created; and there has to be a protection of the regional market from solar water heaters that can be imported from countries where there are no standards and/or certifications.



Argentina

Presentation by **Carlos St. James**

There are several barriers in Argentina that do not allow the solar water heating market to grow at its full potential. Some of these barriers are mentioned below and priorities of actions are suggested in order to develop this market.

The demand for heated water is concentrated in the residential sector, where 85% of the heated water is generated through the use of natural gas. This is due to the low cost of this conventional energy source and the subsidization granted by the government to some sectors of the population, from which several consumers benefit from. In the residential sector, the cost of natural gas varies from USD \$ 0.54 – 1.45/kep, and for the southern zones of Argentina, which receive subsidization, the cost varies from USD \$ 0.22 – 0.55/kep, according to the categories of residential consumption.

Another major economic barrier for the market is the high initial cost of solar water heaters; such system cost approximately USD \$ 1,600/m².

There is also the legal barrier in Argentina that does not allow the solar water heating market to develop at its full potential. Currently, there are no laws that directly incentivize the development of the solar water heating market. There are only laws that under general terms promote the development of renewable energies (for example, Decreto 140/2007).

As a result of these barriers, some of the priorities for action that are suggested are the following:

There could be a stronger and a more specific legal framework which would directly affect in a positive manner the solar water heating market.

Economic and financial incentives can be implemented, such as the deduction of import taxes, duty exemptions, and reduction of the subsidy to natural gas, among others.



Barbados

Presentation by **Marlon Moore**

Despite the buoyant development of the solar water heating market in the past few years, there are still few economic barriers in Barbados. Some of these barriers are mentioned below and priorities of actions are suggested in order to develop this market at its fullest potential.

The demand is highly concentrated in one sector of the economy and it needs to be diversified among several sectors of the economy. This high demand in the residential sector has been due to the 'targeted marketing' that producers, distributors and the government have done throughout the years. Several incentives have been implemented to this sector of the economy, ignoring the great potential that solar water heating can have in other sectors of the economy, such as hotels, the food industry, dry cleaners, pools, etc.

Moreover, despite the high demand of solar water heaters in Barbados, electric systems are still the norm in this country. Around 78,000 households are still connected to the national grid and the demand for electricity has grown at a 4% every year. Considering the high levels of solar radiation in Barbados and the high costs of electricity, solar water heaters should be the norm and not electric systems. The reason of this anomaly is due to the cultural barrier of the population, which are used to using electric showers.

As a result of these barriers, some of the priorities for action that are suggested are the following:

In Barbados, despite the strong and buoyant solar thermal market, the legal framework could be strengthened by making compulsory the installation of solar panels in new edifications. There could also be the implementation of an awareness program to incentivize the population to replace electric showers or any other conventional energy sources and use alternative energy sources, such as solar energy for water heating.

Economic and financial incentives could also be implemented to other sectors of the economy, such as for hotels, pools, and dry cleaners. Such incentives can be like the Homeowners Tax Benefit in Barbados targeted for the residential sector, which allowed consumers to deduct the full cost of the solar water heater system from their income taxes.



Brazil

Presentation by **Elizabeth Marques**

Despite the development and the strong solar water heating market in the past few years, there are few barriers in Brazil. Some of these barriers are mentioned below and priorities of actions are suggested in order to develop this market to its fullest potential.

Electric showers are still the norm in Brazil. In the year 2005, there were more than 40 million showers installed in the country. This is due to the cultural barrier; consumers perceive the initial cost of the solar systems as too high in comparison to the costs of an electric shower and thus do not consider that in the long term it is more beneficial economically to use alternative sources due to the low payback investment period of solar systems.

The PBE label only considers the collectors' performance, but does not include quality issues, such as durability, quality of materials, glass resistance, etc. Also, the labeling programs are still voluntary in Brazil and not mandatory.

As a result of these barriers, some of the priorities for action that are suggested are the following:

In Brazil, another certification could be created and implemented that would consider in its standards the collectors' performance and quality issues (durability, quality of materials, glass resistance, etc.). Some of the shortcomings of the PBE labeling program may be corrected through a new Brazilian standard that could be very similar to European ones, NBR 15 547. Such standard, it is expected to come into force in 2011.

Moreover, in Brazil economic and financial incentives can be implemented in order to promote the use of solar panels instead of electric showers for water heating. Some of these incentives can be duty exemptions, reduction of the subsidy to natural gas, among others.



Colombia

Presentation by **Henry Zapata**

There are several barriers in Colombia that do not allow the solar water heating market to develop fully. Some of these barriers are mentioned below and priorities of actions are suggested in order to develop this market.

None of the laws and decrees in Colombia focuses only on solar energy for water heating; there are only laws that focus, in a more general manner, in the development of other renewable energies, such as wind, biomass and others.

The demand of solar water heaters in Colombia is highly related and dependent on government programs. Since the year 1979 the great peaks in the demand side have been because of massive housing programs organized by the government, which seek to install SWH in several residences.

The government subsidizes natural gas and electricity to the low income sectors of Colombia. Considering that 46.8% of the population is below the poverty line, a large percentage of the inhabitants benefit from the subsidy granted by the government.

As a result of these barriers, some of the priorities for action that are suggested are the following:

Also, the government can elaborate and undertake laws that would regulate and control the market of thermal solar panel. Such laws can be like the one implemented by the program called Ciudades Solares (Solar Cities) in Brazil, which seeks to install solar water heaters in new buildings.

There can be an implementation of several economic and financial incentives so that the demand would no longer be dependent on massive housing programs undertaken by the government. Such incentives can be tax reduction to the consumers that buy SWH; reduction of tax imports of SWH; loans to consumers to buy such systems; reduction of subsidies to natural gas and electricity; and more housing programs like the Programa "Las Gaviotas" (Las Gaviotas Program) can be implemented. This housing program sought to include the cost of the solar panel within the total cost of the house, and financed this system at the same interest rate (15%) and payback period (15 years).



Nicaragua

Presentation by **Rodolfo Raudez**

There are several barriers in Nicaragua that do not allow the solar water heating market to fully develop. Some of these barriers are mentioned below and priorities of actions are suggested in order to develop this market.

In Nicaragua, the government is granting subsidy to the photovoltaic solar panels and not for the solar water heating systems. That is the reason why the first mentioned technology is having a higher penetration rate in Nicaragua than the second mentioned technology. Financial incentives are primary and necessary for the development and the acceptance of non-conventional technologies in a country, such as solar water heating panels.

There is also a lack of an adequate and strong legal framework, which can incentivize and promote the development of thermal solar energy. There are few laws that incentivize the development of renewable energies; but there are almost no laws that promote the development of thermal solar energy in Nicaragua.

As a result of these barriers, some of the priorities for action that are suggested are the following:

Laws can be elaborated and implemented to regulate and control the solar water heating market (consumers, manufacturers, distributors, installers) and to incentivize the development of the thermal solar energy market through legal incentives.

Moreover, economic and financial incentives can be implemented in order to increase the demand in certain sectors of the economy (hotels, pools, hospitals and other commercial entities and industries) through tax deduction of solar water heaters, subsidies, etc.



Peru

Presentation by **Abel Gutierrez**

There are several barriers in Peru that do not allow the solar water heating market to develop fully. Some of these barriers are mentioned below and priorities of actions are suggested in order to develop this market to its full potential.

The demand in this country is low; only 30,000 solar water heaters are installed, which means that roughly 1% of the population has one of these systems. Moreover, it is expected that demand will be increasing at a rate of 2% every year. This increasing demand rate is extremely low if it is compared to other increasing demand rates in other countries, such as in Barbados and Brazil. The reason why the demand for solar panels has a low increasing rate in Peru is due to the low costs and subsidies of conventional energy sources for water heating, such as natural gas and electricity. The cost of electricity for the residential sector is lower than the average cost of electricity in all Latin America. Moreover, despite this low cost, the low income sectors also receive subsidization for the cost of electricity. More than 67% of the households have the benefit of receiving subsidized electricity. Also, the cost of natural gas is extremely low.

There is a cultural barrier considering that 10% and up to 20% of the population know about this technology and its benefits.

As a result of these barriers, some of the priorities for action that are suggested are the following:

Economic and financial incentives can be implemented in the country in order to incentivize the population to switch from the use of conventional energy sources to non-conventional energy sources such as solar thermal panels for water heating. Such incentives can be import preferences, tax deductions, and loans.

Another priority for action can be to implement awareness programs by the government, associations, organizations, and other entities, so that the population can know more about this technology and the several benefits of solar systems.



Uruguay

Presentation by **Martin Scarone**

There are few barriers in Uruguay that do not allow the solar water heating market to develop fully. Some of these barriers are mentioned below and priorities of actions are suggested in order to develop this market.

The costs of conventional energy sources are subsidized by the government, such as GLP. Also, the government implemented a basic electricity tariff for the low income sectors of the economy. This incentivizes the population to keep on using these conventional energy sources for water heating.

Despite the several training programs, courses, and others, there is still a lack of knowledge and expertise in the subject matter.

As a result of these barriers, some of the priorities for action that are suggested are the following:

One priority can be to implement more economic and financial mechanisms to incentivize the solar water heating market to develop at its full potential. An example of such mechanisms can be tax deduction of the full cost of the solar water heater, loans with low interest rates and long term payback periods for consumers that would like to buy a certain amount of solar panels, duty exemptions, etc.

Another priority can be to increase the human capacity and expertise in this area; in order to have the human resource that it is necessary for this market to develop. This can happen by creating more capacitating and training programs for all the stakeholders in the value chain (fabricators, distributors, installers, etc.) in universities, colleges, and other academic and non-academic entities.