



EIE-06-085 SOLPOOL

Intelligent Energy  Europe

Solar Energy Use in Outdoor Swimming Pools SOLPOOL

Fact Sheets France

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List of Acronymes

ALE	Agence Locale de l'Energie de l'Agglomeration Lyonnaise
ST	Solar Thermal

Etc.

1 National Fact sheet France

The national fact sheets will provide an overview about the situation of the usage of solar thermal heating for outdoor pools. This information will be used to show the state of the art, regarding the special regional conditions and to develop a common approach for the supporting solar thermal systems in this special application. The information was requested by every participating country in the project.

1.1 State of the art of conventional heating systems for outdoor pools

The present common heating systems for outdoor swimming pools and the used fuels are listed.

Used techniques:

- Boilers
- Unglazed solar thermal panels
- heat pumps
- district heating distribution

Used fuels

- Natural gas
- Liquid gas
- Oil

1.2 State of the art of solar thermal applications for outdoor pool heating

A list of present available and used solar thermal technology, especially for pool heating, is provided. This will provide the state of the distribution and the acceptance of solar thermal systems.

Collectortype:

- Glazed thermal solar collector

System details:

- For combined systems (solar and fuel):
 - Usually used for public swimming pools. In this case, if the irradiation is high enough, the water does not go through the boiler room; it is directly going from the collectors to the basin.
 - In this case, the solar panels (usually glazed) are used to heat up the sanitary hot water and also the basins.
- For solar systems (no fuel used)
 - Usually used for private swimming pools.

1.3 Best available technology and best practice for solar thermal outdoor pool heating

The best technical approaches, regarding the national and regional conditions, are listed here. Every participating country will give the best practice for the installation of solar ther-

mal pool heating systems according to the special national conditions. This information will be used in the national campaigns.

Best available technology:

- Tube collectors and heat exchange optimal use of gained heat

Best practice:

- Unglazed solar panels (flexible or no-flexible, depending of the manufacturers and of the installers).

1.4 Boundary conditions

The list should show the national and regional barriers, which must be overcome to improve the awareness of the end users and the implementation of solar thermal heating systems. This includes technical or climate barriers but also as governmental, financial and societal boundary conditions.

Technical or climatic barriers:

- Technical and manufacturing skills for solar or renewable energy development.
- Lack of educational system to provide adequate training in new technologies
- Lack of reliable solar installation, maintenance and inspection services.
- Solar panels surfaces needed for swimming pools installation are very high and it is difficult to find enough room.

Financial Barriers:

- High cost of solar and other renewable energies and technologies, plus an additional cost compared with conventional energy
- Inadequate financing options for renewable energy in swimming pool projects are slight for solar swimming pool installation.

Governmental barriers:

- Lack of government policy supporting renewable energy like the lack of regulations to support the development of solar or other renewable energies
- Lack of adequate codes, standards, interconnection between partners and guidelines
- Lack of stakeholder/community participation in energy choices and solar projects
- As the solar surfaces needed are high, it is very complicated in France to get the acceptance of the authority for the installation (urbanism and architectural problems, building permit,

Social barriers:

- Lack of information dissemination and consumer awareness about solar energy
- Difficulty overcoming established energy systems
- Poor perception by public of renewable energy system aesthetics
- Failure to account for all costs and benefits of energy choices
- Difficult to add a solar system to a working installation with conventional energy

1.5 Existing norms and standards

The existing standards and norms for the installation and use of solar thermal heating devices are stated here. Additional outdoor swimming pool norms and standards concerning solar thermal heating systems are listed. All important standards, which impacts the installation and usage of a solar thermal system are named and will be concerned by the development of the campaign strategies.

Solar Thermal pool heating:

- DTU (Documents techniques unifiés) regulation
- CSTB or Solarkeymark to solar equipment reference
- Referenced installers (Qualisol)

Solar thermals applications:

- CSTB or Solarkeymark to solar equipment reference
- Referenced installers (Qualisol)
- DTU (Documents techniques unifiés) regulation

Outdoor pool operation concerning ST heating:

- Etienne Gagnaire, Villeurbanne, France
- Lyon Vaise, France

1.6 Cost benefit analysis and impact

An important fact for the end user is a cost benefit analysis. Here the common costs for solar thermal systems, including system and installation costs per m², are stated. An estimation of the size of the national market is done, not including small private pools. And the gain of heating power per m² collector surface and the resulting savings of CO₂ are described.

Market size:

- More than 27 privates swimming pools (regional)
- More than 28 public swimming pools (regional)

System costs per m² collector, whole costs with installation:

- unglazed thermal solar collector:
 - Flexible unglazed thermal solar collector: 100 - 200 €/HT/m²
 - No flexible unglazed thermal solar collectors: 200 - 400 €/HT/m²
- glazed thermal solar collector: 800 - 1200 €/HT/m²

Heat gain in kWh per m² collector according to solar radiation and opening duration of the pool:

On the solar map of France, Lyon, the average isolation per day is between (45° - South):

- average insolation year: 3.8 and 4 kWh/m²
- unglazed thermal solar collector:
 - Flexible unglazed thermal solar collector: 250 – 300 kWh/m².an
 - No flexible unglazed thermal solar collectors: 350 – 450 kWh/m².an
- glazed thermal solar collector: 500 – 600 kWh/m².an

Energy and CO₂ savings per m² collector:

Heating system	CO ₂ Emission in g/kWh	Saved CO ₂ in kg/m ² and year
Electric	180	45 - 108
Oil	290	723 - 174
Natural gas	243	61 -146
Heat pump Air	180	
Heat pump Soil	180	
Heat pump Water	180	
Solar Thermal	0	0
Data: Umweltbundesamt Germany; ADEME, France		

2 Requirement Sheet France

In this sheet the requirements of a solar thermal system, regarding the needs of the end users

Requirements of the End Users	Very Important	Less Important
Power gain for heating system	X	
Saving of energy costs	X	
Cost benefit from installing ST system	X	
Long time durability of the system		X
Low effort for installation		X
Low effort and costs for maintenance	X	
Low required space for collectors		X
Integration in existent heating systems		X
No problems with the pool hygiene	X	
Plant safety, no risk for pool users	X	
Easy handling of the system		X
Availability of grants /subsidies		X
Independency from increasing energy costs		X
Environmental protection	X	
Communication		X
Other		

3 Funding Sheet France

The table shows the information of national and regional available grant programmes. They mainly should list the programmes for solar thermal use for outdoor swimming pool heating, but also schemes, which will support the use of solar thermal systems

Funding sheet "France _ALE"		
Contact information	Title	
	First name	Cécile
	Last name	VERNIER
	Position	Chargée de missions Energies renouvelables et Habitat
	Email	cecile.vernier@ale-lyon.org
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Financing Information	Organisation	France State ADEME (National Energy Saving and Environmental Agency) Rhône-Alpes Region Rhône department A few municipalities
	Type of Support	Funding, tax system
	Available Money	
	Share of total budget	<p>- French State : 50% of the price of the solar equipment for specific <u>individual private people</u>;</p> <p>ADEME: up to 30% of the global investment (€HT) for specific <u>collectives projects</u>;</p> <p>- Rhône-Alpes Region:</p> <p style="padding-left: 40px;">- <u>individuals systems</u> : 500€ for a Solar individual sanitary hot water system or 1200 € for a Solar Individual heating and sanitary hot water system depending on family incomes;</p> <p style="padding-left: 40px;">- <u>collectives systems</u> : 30% of the global investment (€HT) for collective project or 20% for summer swimming pool;</p> <p>- Rhône department: 300 € for the maintenance of a Solar individual sanitary hot water system system;</p>

	<p>- a few municipalities: Dardilly, Feyzin: 300 or 500 € for a Solar <u>individual sanitary</u> hot water system</p> <p>- Value Added Tax: 5,5% (instead of 19,6%);</p>
Who can apply	Anyone, according to the regulation
Requirements for application	Anyone, according to the regulation
Targeted areas	<p>France State: national</p> <p>ADEME: national</p> <p>Rhône-Alpes Region</p> <p>Rhône department</p> <p>A few municipalities: Dardilly, Feyzin</p>
Short description	57 municipalities, 1 300 000 inhabitants
Documents	From France State, ADEME, Rhône-Alpes Region, Rhône department, a few municipalities
Source of information	Web site, brochures, etc.
Year of beginning	<p>France State: 4 years around,</p> <p>Rhône-Alpes Region: 30 years around,</p> <p>Rhône department: from April, 2007</p> <p>Municipalities: 2006, 2007</p>
Information website	<p>www.ademe.fr</p> <p>www.rhonealpes.fr</p> <p>www.rhone.fr</p> <p>www.ale-lyon.org</p> <p>www.industrie.gouv.fr/energie/sommaire.htm</p>

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