



AIEA Presentation

Solar Systems

www.aiea.ie



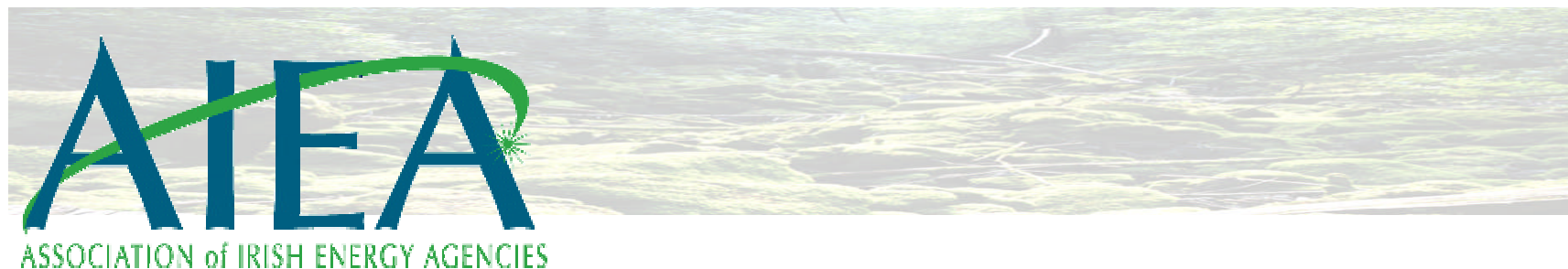
Introduction to the AIEA

- ✍ 16 Local Energy Agencies in Ireland, including 3 in Northern Ireland.
- ✍ Association of Irish Energy Agencies (AIEA) formed in November 1998.



Central Aim of the AIEA

- ✍ The overall common aim of the constituent member of the Association is to promote renewable energy, energy efficiency and the rational use of energy, to improve the quality of the environment and to contribute to sustainable development.



Mission Statement:

“The Association of Irish Energy Agencies (AIEA) is an All-Ireland body assisting the development and implementation of energy policy and best practice in an impartial and effective manner at local, national and EU level, through its own actions and by strengthening the capabilities of its members”

Structure of the AIEA

The AIEA is a self-governing organisation, which provides both a critical mass and a sense of continuity for its constituent member energy agencies. It can also provide a coherent and coordinated voice at local, national and European levels







Current officers include

- ✍ Chairman**
- ✍ Secretariat**
- ✍ Treasurer**
- ✍ PR Team**
- ✍ Training Officer**

www.aiea.ie

Solar Thermal Systems

Renewable energy heating systems

-  ***How do Solar thermal systems work?***
-  ***How are the collectors set up?***
-  ***What size should they be?***
-  ***Types of collectors***
-  ***What other components are needed?***
-  ***Maintenance and operation***



How do Solar thermal systems work?

- ✍ Solar radiation hits an absorber surface, which converts this solar energy into heat. A heat transfer circulating fluid cools the absorber and transfers the heat to a hot water cylinder or heating system.
- ✍ Most Flat Plate and Evacuated Tube systems use a closed-loop indirect system. The heat-transfer fluid flows through a heat exchanger in a hot water storage tank, heating the water to be used. The circulating fluid never comes into direct contact with the water.
- ✍ Air Heating and Ventilation collectors can directly heat individual rooms or pre-heat the air passing into a heat recovery ventilator or through the air coil of an air-source heat pump.



How are the collectors set up?

- ✍ Solar panels are usually installed on the roof or integrated into the roof covering. They can also be wall mounted or free standing.
- ✍ They should be orientated between south-east and south-west at a tilt angle of between 25deg – 45deg.
- ✍ Planning permission may be required, e.g. where panels face a public road.

What size should they be?

- ✍ A solar heating system used for domestic hot water heating should be sized so that no excess heat is produced in summer. A typical rule of thumb is 1m² of collector and 75litres water storage per person.
- ✍ Up to 40% of space heating can be supplied for a well insulated 120m² house by using 12m² of collector and 750L of hot water storage.

Types of Collectors

- ✍ There are 3 main types of solar collector, described below.
- ✍ These should comply with European Quality Standards EN12975 or EN12976.

- ✍ Flat Panel Collectors
- ✍ Evacuated Tube Collectors
- ✍ Air Heating and Ventilation collectors

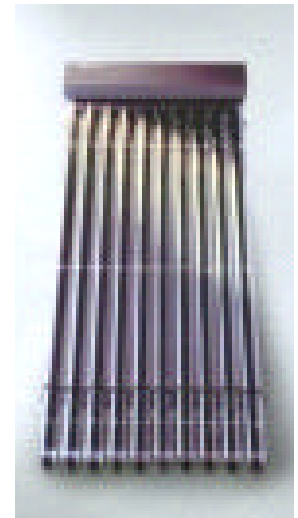
Flat Plate collectors

- ✍ Flat-plate collectors are currently the most common collector type for domestic hot water heating.
- ✍ They consist of an insulated, weatherproof metal box with a glass or plastic cover and dark absorber plate with pipes to convey the heat transfer circulating fluid.
- ✍ The transparent cover allows light to strike the absorber plate whilst minimising the amount of heat that can escape.



Evacuated Tube collectors

- ✍ Evacuated tube collectors consist of rows of parallel transparent glass tubes, each containing an absorber tube.
- ✍ Evacuated tube collectors are more expensive and less robust than flat-plate collectors, however they have a number of advantages:
 - ✍ Collector efficiency remains high in cloudy conditions and low temperatures.
 - ✍ The circular tubes means that the sun is shining directly on the absorber for most of the day.
 - ✍ Evacuated-tube collectors have the ability to heat water to higher temperatures than flat plate collectors.
 - ✍ Evacuated-tubes can be added or removed as hot-water needs change.



Air Heating and Ventilation collectors

- ✍ Solar air heating systems use air as the heat transfer circulating fluid.
- ✍ They are used in conjunction with an integrated ventilation system or to heat individual rooms.
- ✍ They can also be installed with an air/water heat exchanger to heat domestic hot water in summer.
- ✍ Air collectors produce heat earlier and later in the day than liquid systems. Some collectors have an integrated PV power supply to operate a fan blowing the heated air.

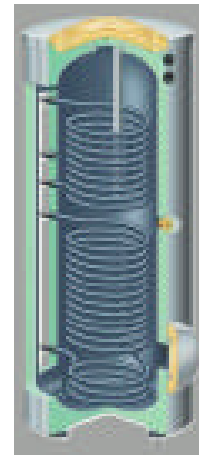


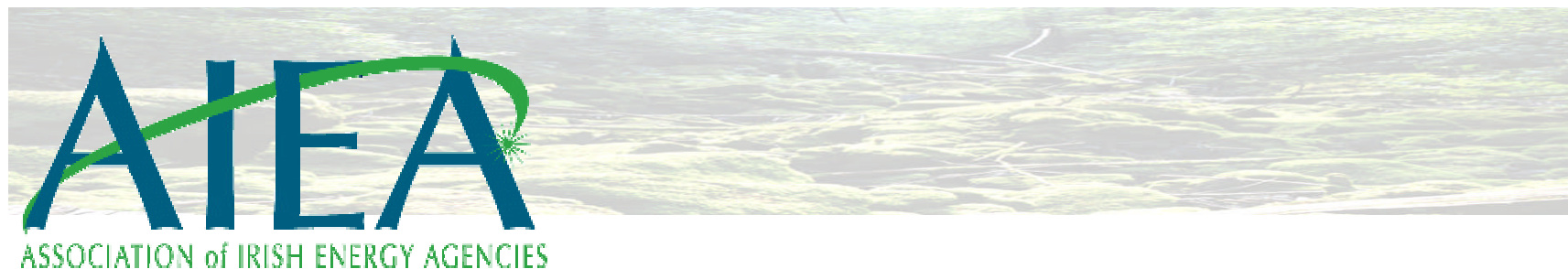
What other components are needed?

- ✍ A DHW cylinder with two indirect coils is usually used. The lower coil transfers solar energy from the transfer fluid to the DHW water. The upper coil is supplied by a back-up boiler.
- ✍ A control unit measures the collector and DHW cylinder temperature and starts a circulation pump when the collector temperature is higher than the cylinder temperature.
- ✍ A safety valve & expansion vessel balance pressure changes within the system.

Maintenance and operation

- ✍ A solar heating system requires very little maintenance.
- ✍ Rainfall ensures that the dust and leaves are removed regularly.
- ✍ Modern solar thermal systems have an average lifetime of 25 years or more.





Thank you for your time

For more information on the AIEA or your local energy agency
Log on

www.aiea.ie

www.aiea.ie

