The background of the slide features a large, faint watermark of the Indiana state seal. The seal depicts a central torch with a flame, surrounded by a circular arrangement of stars. The word "INDIANA" is written in an arc above the torch. The entire watermark is rendered in a light yellow color against a light blue background.

# **Solar Power: Is it the IN thing?**

Can solar energy collection devices be viable choices to lessen Indiana's dependence on fossil fuels?



# Methodology

- Brainstorming activity
- Decided which questions/areas each person would research.
- Resources used:
  - Internet
  - Environmental Science Readings



# Discovery



# What is Solar Power?

A faint, stylized illustration of a sun with rays and stars is centered in the background. The sun is depicted as a glowing orb with rays extending outwards, surrounded by several five-pointed stars of varying sizes. The entire scene is set against a light blue background.

- Energy from sun's rays or solar radiation that can be captured and converted into electrical energy.
  - The Sun's energy (radiation) contains photons, which become excited and cause electrons to bounce around and conduct an electrical charge which can be transported and/or utilized by consumers.

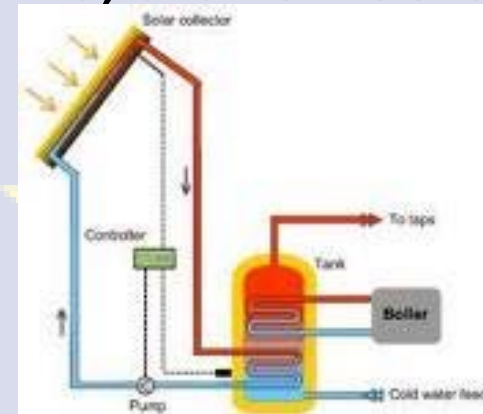
# Two Components of Solar Energy Systems

- Collector
  - Collects radiation and converts some of the radiation into other energy forms.
- Storage Unit
  - Holds excess energy produced

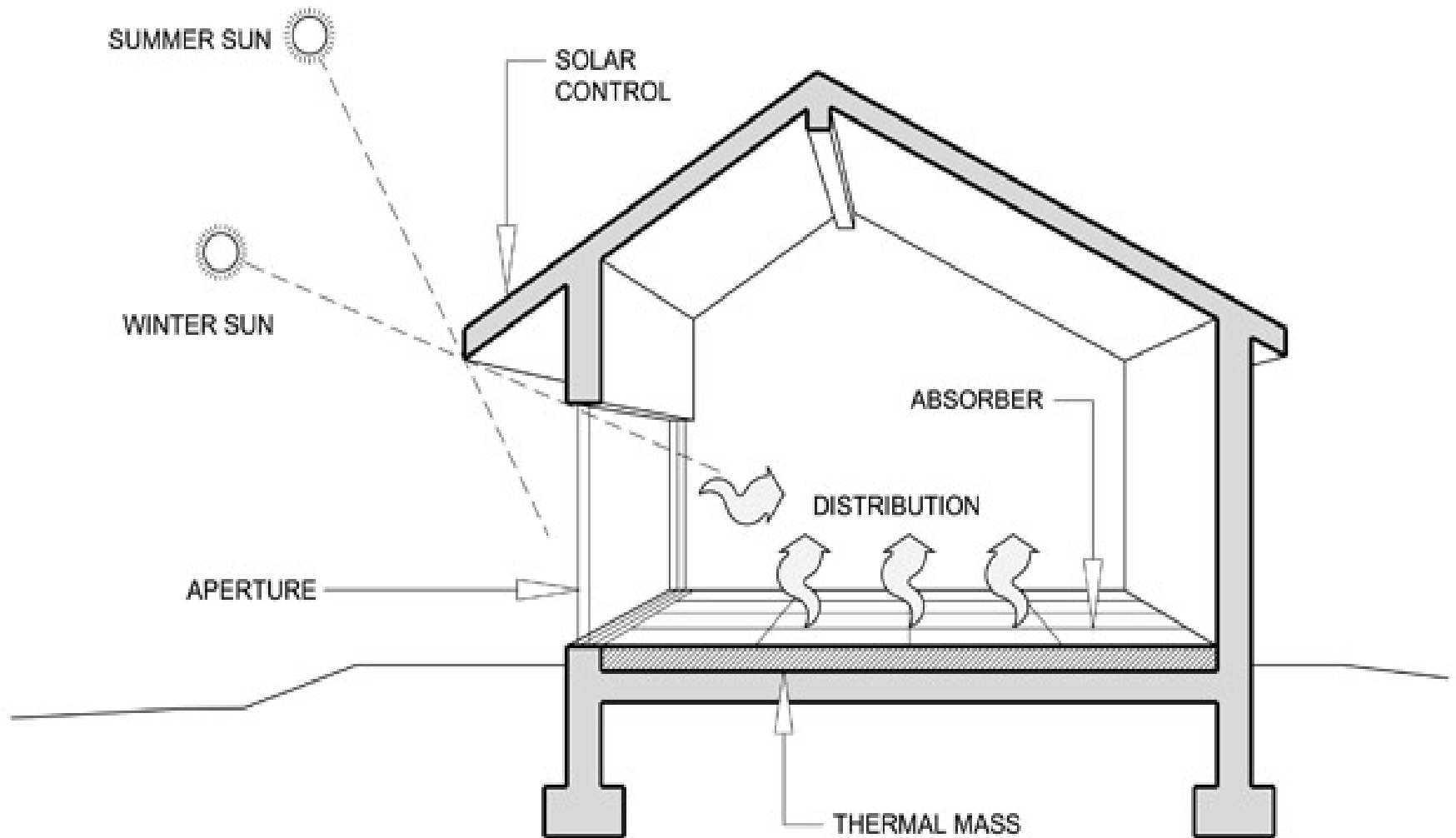


# Harnessing the Sun's Energy

- Collectors
  - Flat-plate: PV cells
  - Focusing: mirrors with synthetic oils
  - Passive: painted walls and pipes for water heating, heat sinks, south facing windows, stone floors
- Used for:
  - Heating water and homes
  - Cooling: Not so good! \$\$\$



# FIVE ELEMENTS OF PASSIVE SOLAR DESIGN







Video: Learn 360 Solar Power : An Overview <http://www.learn360.com/showvideo.aspx?ID=128193>



# Hoosier Energy Usage

A large, faint yellow graphic of a torch with a flame, surrounded by several yellow stars, is centered in the background of the slide.

- 447,000,000 BTU's per capita
  - 93% Coal fired
  - 3% Natural Gas
  - 4% renewable energy (not divided out)
- Indiana is ranked 8<sup>th</sup> in energy use per person.

(Institute from 21<sup>st</sup> Century Energy website)

Pros	Cons
No Pollution made	Expense
Low maintenance	Weather can affect efficiency
No geographical limitations	Available space
No transportation of electricity conversion	Aesthetics
Renewable	Disposal
No by products made	Dust, Dirt, Debris
Not harmful to wildlife during energy prod.	Shade trees
Longevity	Production only during daytime
	Toxic manufacturing by-products
	Manufacturing destroys habitat
	Environmental Impact

INDIANA

Is it the IN thing?



# Feasibility

- Sunlight not an issue
- Expensive to acquire/build
- Payoff takes 30-40 yrs.
- Not feasible now, maybe by 2050.
  - Double our efficiency of PV cells

“Cost is \$3 per watt for a PV system and needs to drop to a \$1 per watt to be competitive with traditional electric power.” ~ *Dr. Wm. Hutsell, Purdue University, Solar House Project*

# Environmental Impact

- Wildlife Habitat destruction by big arrays.
- Change of weather patterns from big arrays
- Decommissioning of panels is considered hazardous waste.
- Production of panels and mirrors utilizes various chemicals considered toxic.
  - Fire!



Photo: [www.itsnature.org](http://www.itsnature.org)

# E-WASTE

[YouTube - The problems caused by E- waste](#)



Light, Electrons, Action!





# Action Plan



- Continue research into efficiency of solar collectors.
- Cut down on manufacturing using toxic chemicals or production of toxic by-products.
- Use of renewable energy without habitat destruction.
- Lobby for enforcement of environmental laws regarding production and decommissioning.