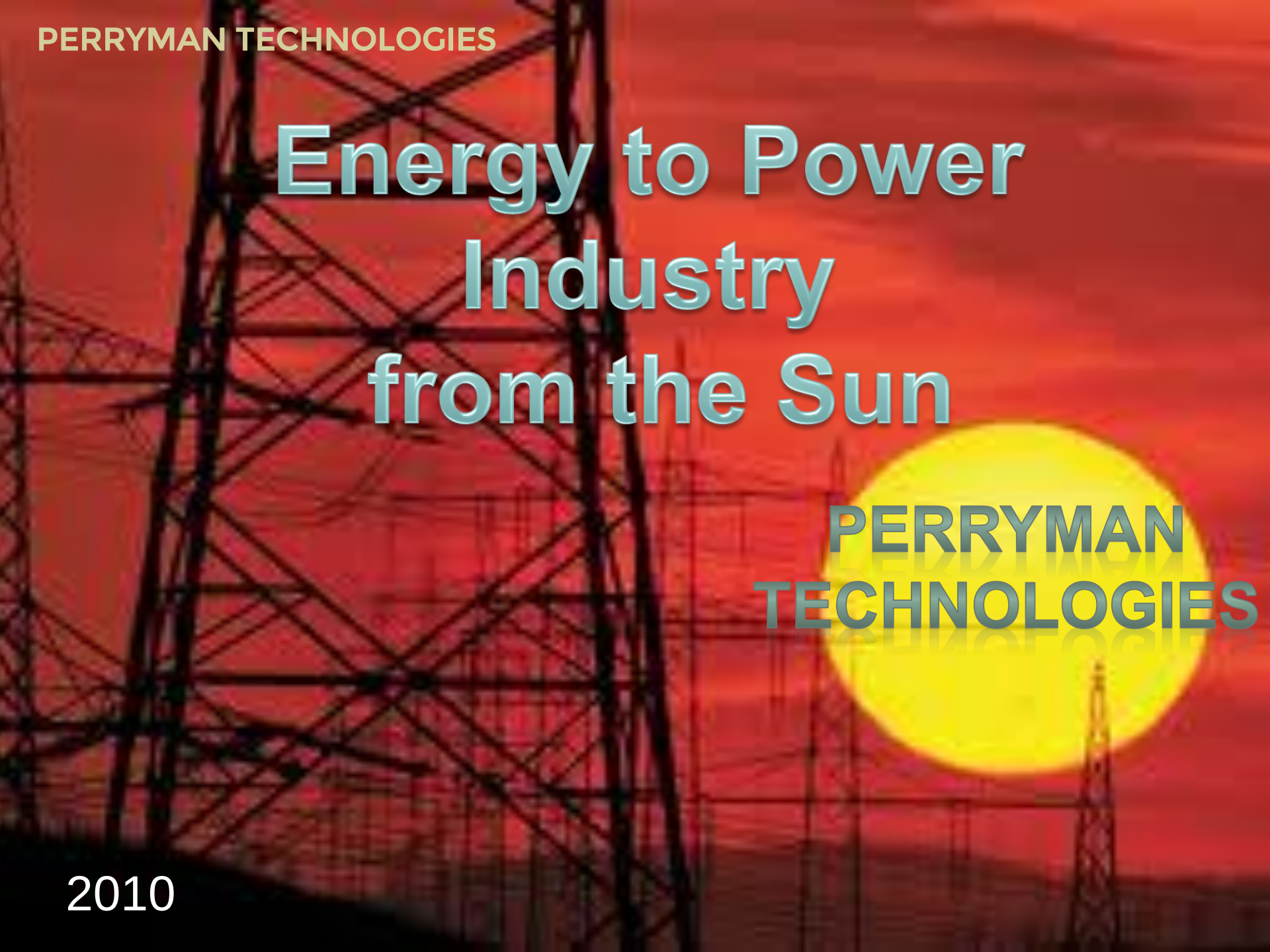




PERRYMAN
TECHNOLOGIES

AMAZING
ZERO POLLUTION
TECHNOLOGY
2017



PERRYMAN TECHNOLOGIES

Energy to Power Industry from the Sun

PERRYMAN
TECHNOLOGIES

2010

PERRYMAN TECHNOLOGIES



A family of technologies which manage high temperature energy as well as harvest the Sun, to create an entirely new economy for industries globally

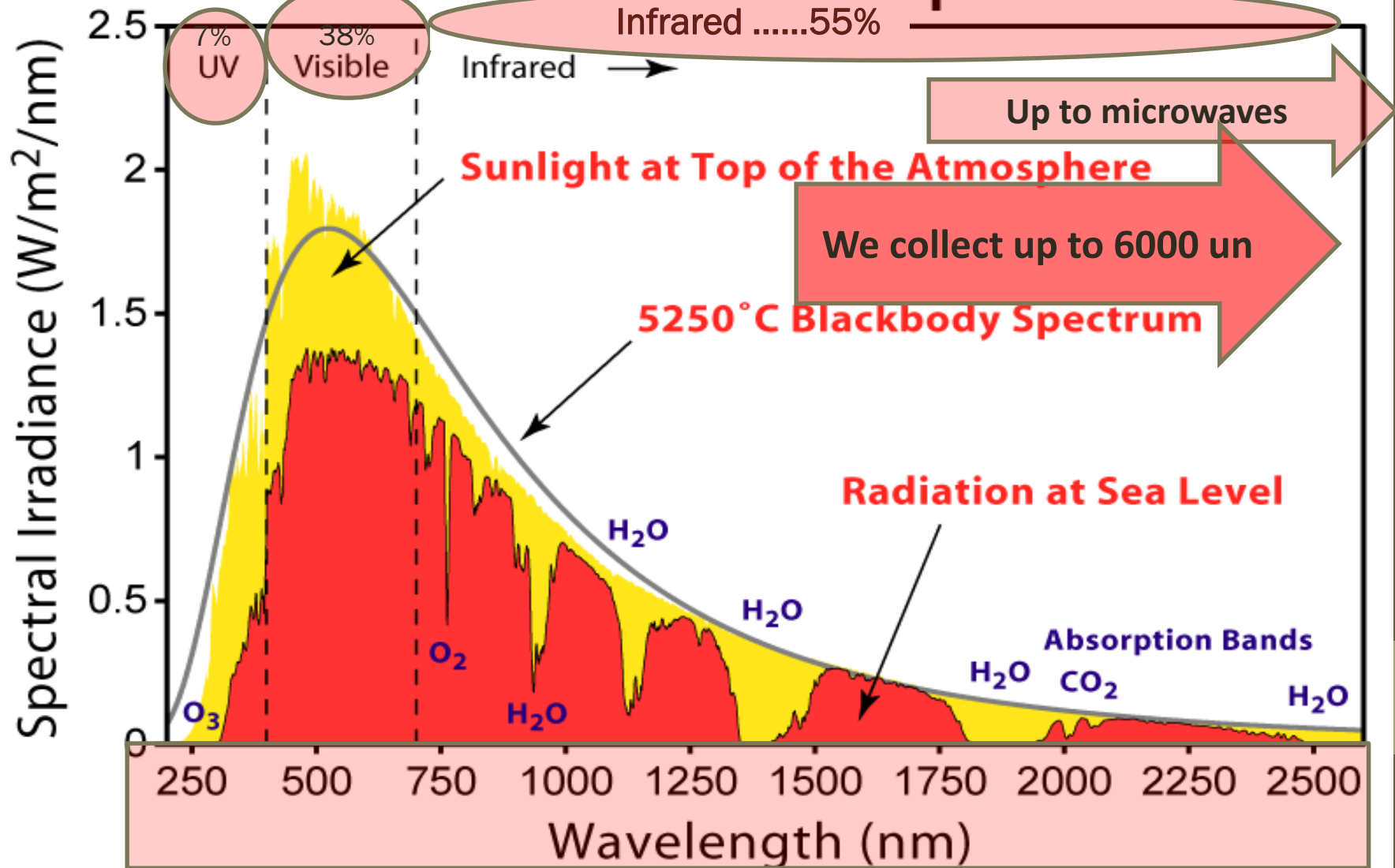
Thermal Solar with a Big Difference

- We operate 24/7 and 365 day a year
- We can deliver energy at temperatures to melt stainless steel or to operate a blast freezer.
- We can recovery waste heat up to 2000 degs C and put it to use.
- We can store high temperature thermal energy for weeks
- We have system for, solar farms, remote villages, rooftops, for Hurricane prone Islands, to supply grids with both base load and peak needs
- We can supply constant energy almost anywhere, to power almost anything, for almost any application.

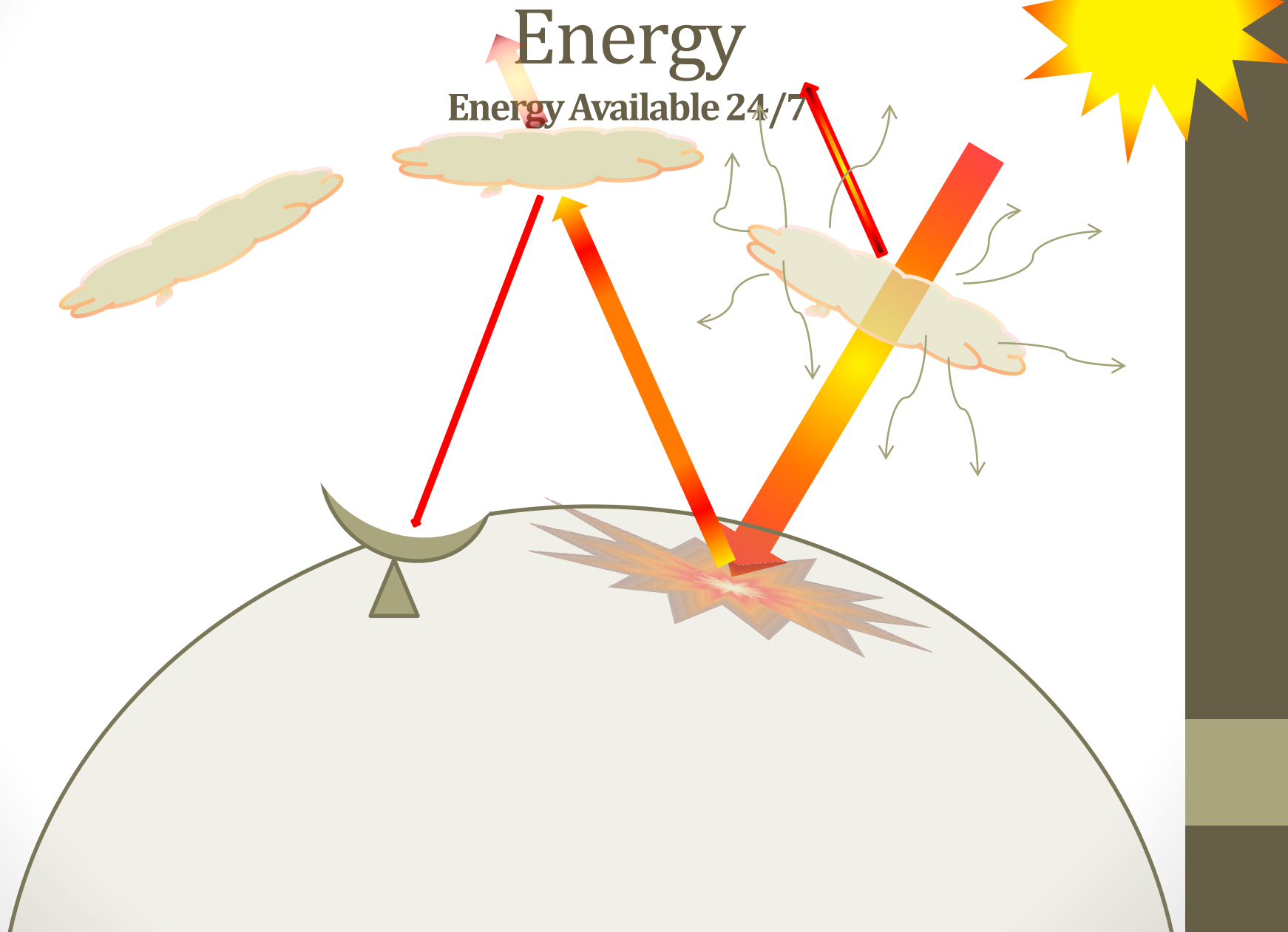
How & Why <> Read On

We collect the total the

Solar Radiation Spectrum

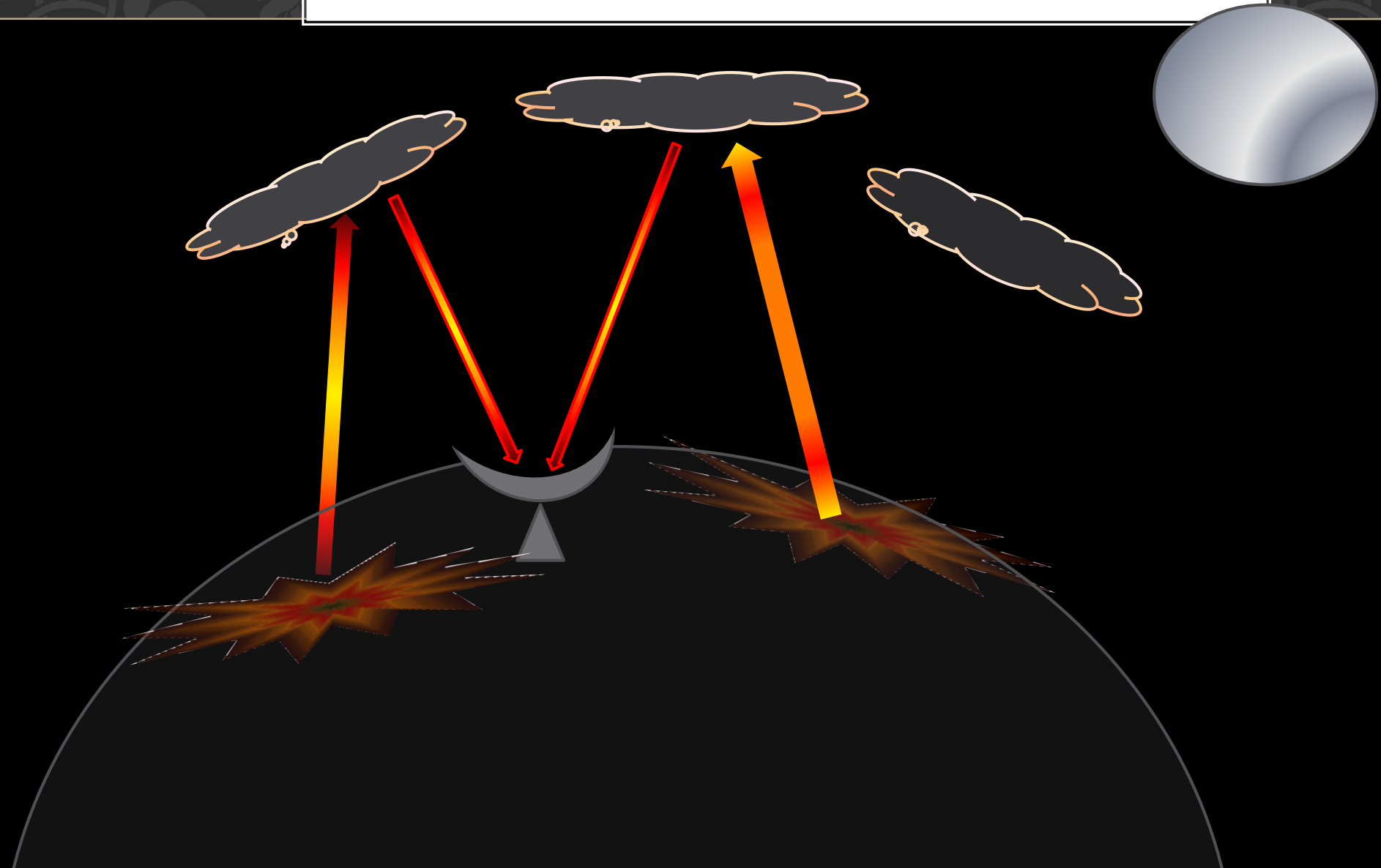


How Wonderful is Infrared



INFRARED ENERGY

AT NIGHTTIME AND NEARLY CONSTANT ALL YEAR



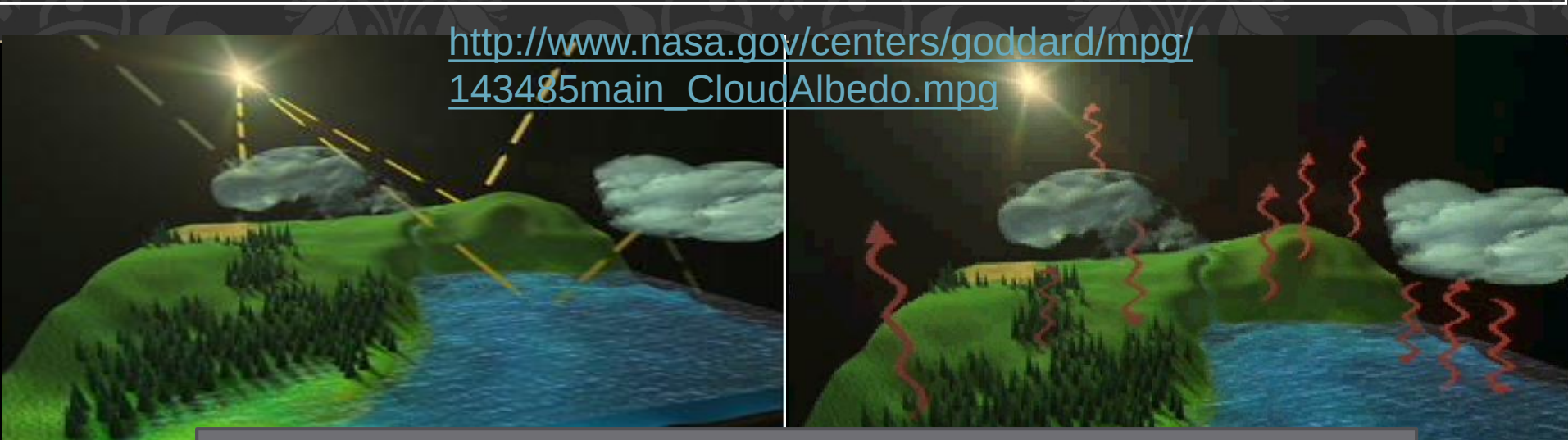
WHY ENERGY DAY AND NIGHT AND NEARLY CONSTANT ALL TIMES OF THE YEAR?

- The clouds and moisture in the atmosphere trap the longwave radiation and re-radiated as indirect radiation. This indirect radiation hits the Earth and is reflected back into space, only to be captured by the clouds and moisture in the air. The process begins again and continues, day and night throughout the year. The following are copies from three NASA animations, illustrates this phenomena.
- The first shows the cycle between day and night, when the sun's energy is captured by the clouds and moisture in the air. The collected is then radiated in all direction including the planets surface at all times of the years.
- The second animation shows the movement of the radiation through the seasons and its intensity at different locations around the earth.
- The Third animation compares movement of the cloud covers between different areas of the planet. If you take time to go to the sites, you will note, that this cloud cover conforms to the intensity radiation at different points, during different times of the year.

It is important to note is this innovation removes solar from an intermittent energy source and allows continued access to the energy of the Sun with similar reliability of using Coal, Hydrocarbons, Hydroelectric and Nuclear. When enhanced by storage PERRYMAN's Technology is dependable enough to be used in base load and peaking grid application

**STILLS OF A NASA ANIMATION, ILLUSTRATING CLOUDS, MOISTURE AND THE PLANET
ABSORPTION OF THE LONG WAVE DOWN WARD FLUX; IT THEN SHOWS THE RE-
EMITTING INFRARED AND RE-TRAPPING CAUSING A NEAR CONTINUOUS SOURCE OF
INDIRECT INFRARED ENERGY**

http://www.nasa.gov/centers/goddard/mpg/143485main_CloudAlbedo.mpg



The long wave flux is adsorbed by the water vapor and cloud as well as the planets' surface, then re-emitted in all direction including back to Earth. Indirect infrared is also trapped and likewise re-emitted both day and night



STILL SHOTS OF NASA ANIMATION THAT ILLUSTRATES THE CORRELATION BETWEEN NET RADIATION THAT REACHES THE EARTH AND CLOUD COVER DURING THE SAME PERIOD

Compared is July 2007 for complete animation go to:

http://earthobservatory.nasa.gov/GlobalMaps/view.php?d1=MODAL2_M_CLD_FR

Global Maps

July 2007

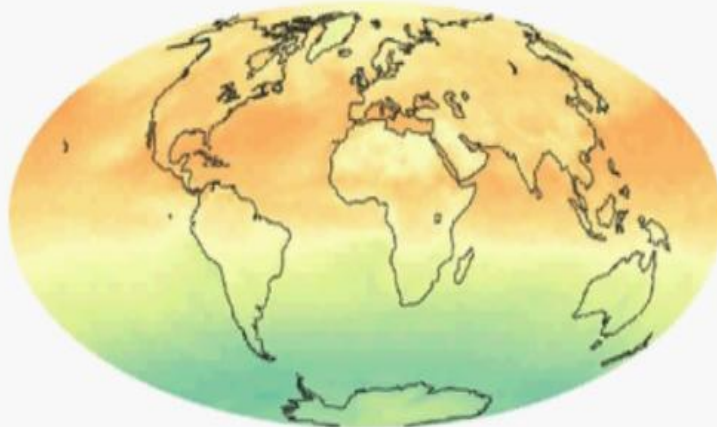
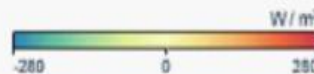
Cloud Fraction



Global Maps

July 2007

Net Radiation

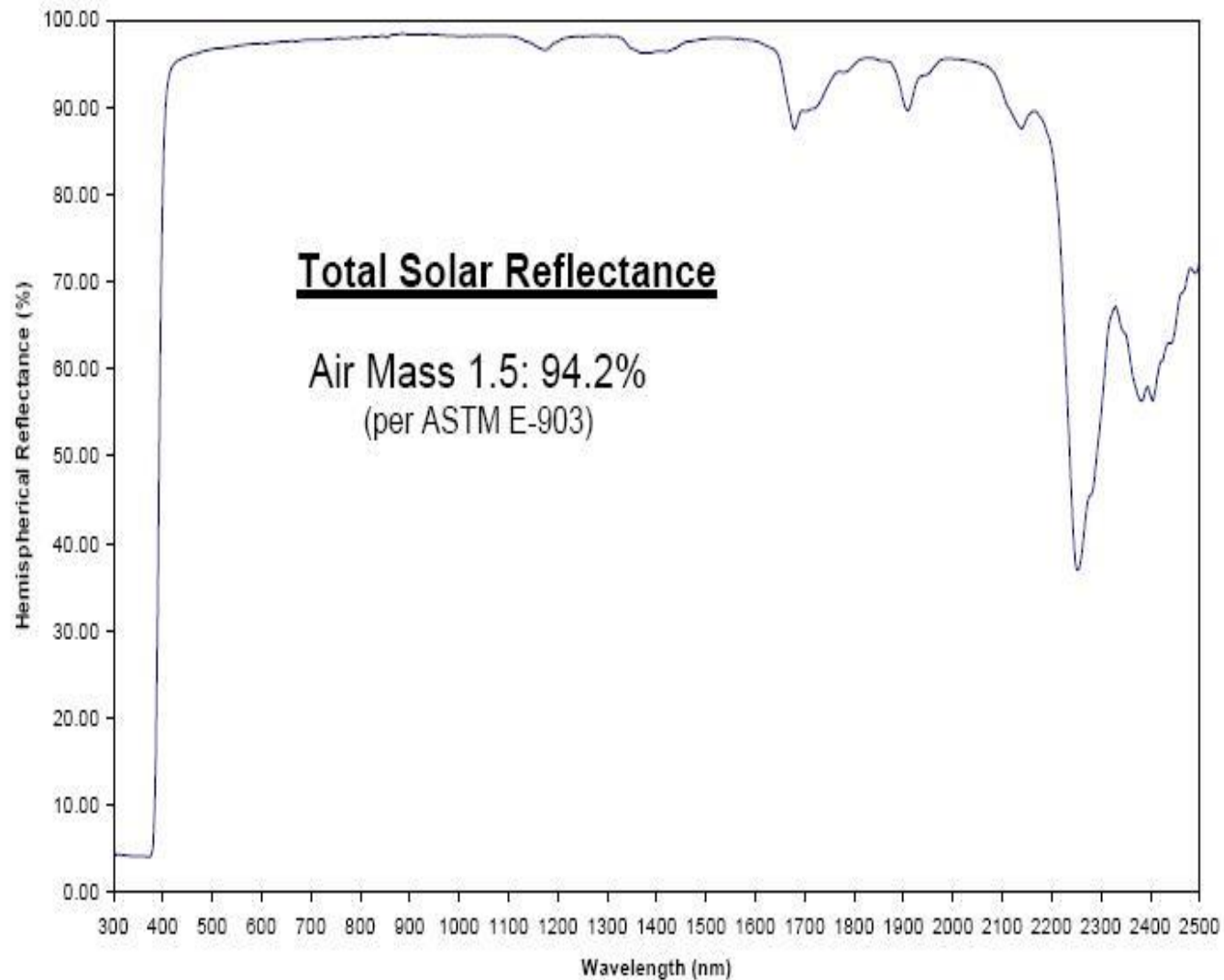


Compared is July 2007 for complete animation go to:

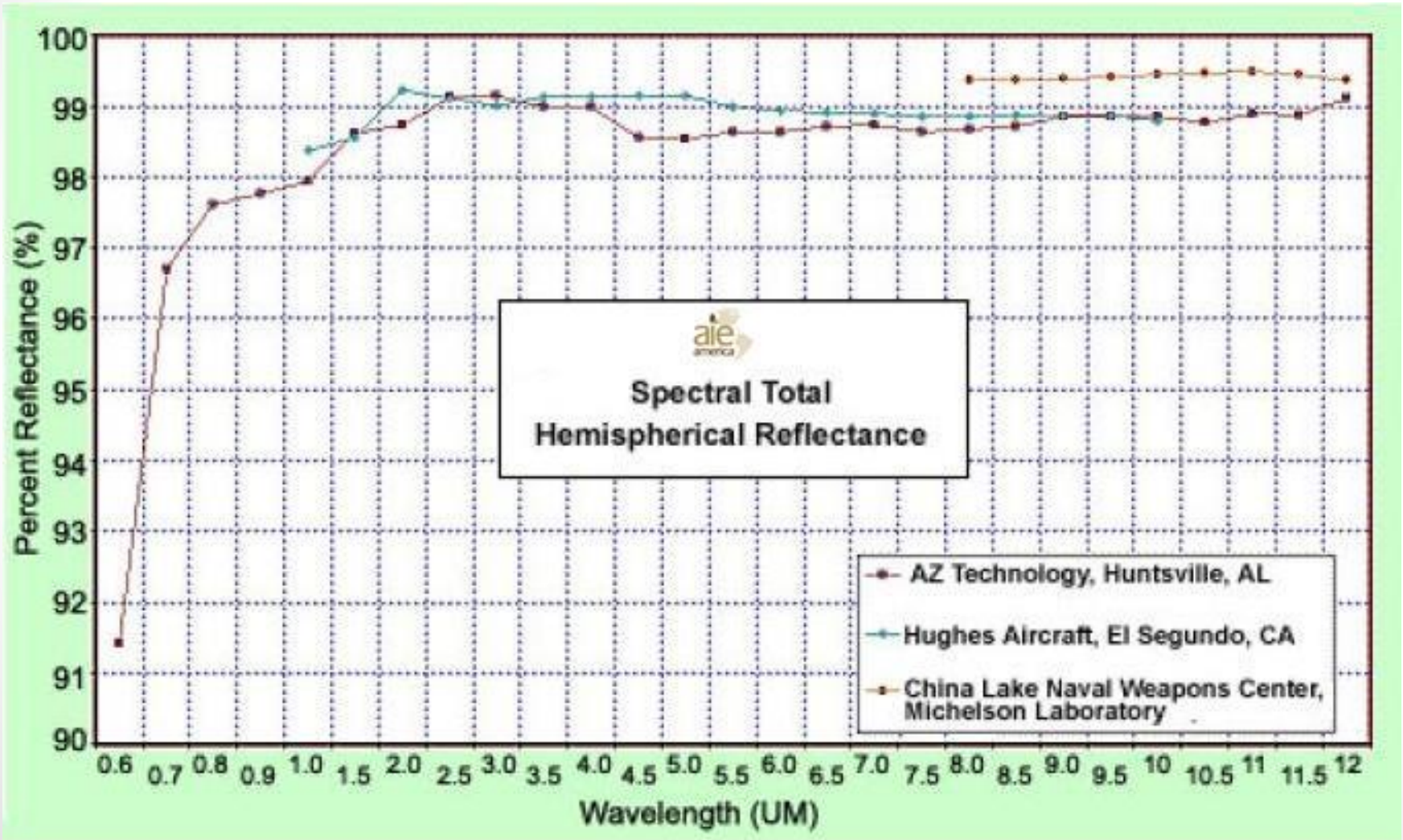
http://earthobservatory.nasa.gov/GlobalMaps/view.php?d1=CERES_NETFLUX_M

Optical Performance of 3M Solar Mirror Film

Developmental Film



Perryman's Tested Substrate Film IR Reflectance



VARIOUS COLLECTOR DESIGNS FOR VARIOUS APPLICATIONS



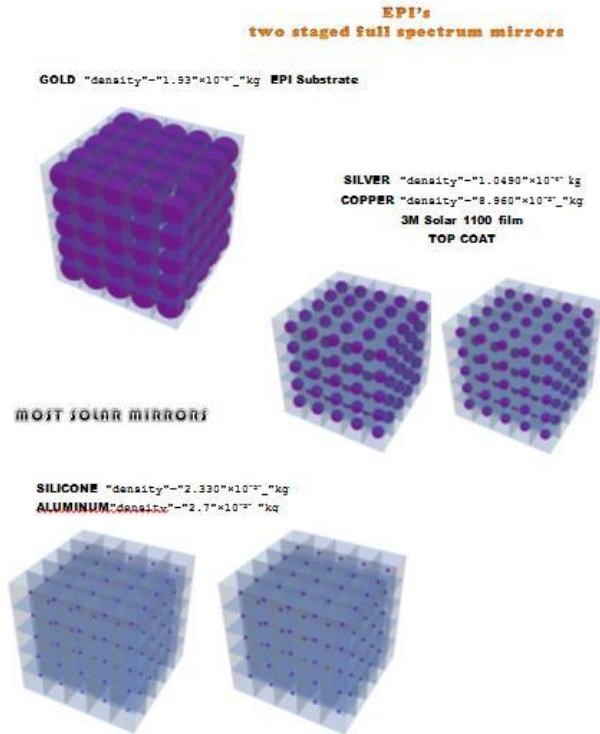
Our Full Spectrum Solar Thermal Collectors range from troughs to dishes of sized from 12 meter and 22.6 meter. Because they collect a larger fraction of the Sun's energy any other collectors which only UV, and near IR. Our collectors take up less space and can reach higher temperatures (up to 1800°C) allowing the storing of thermal energy at higher density and providing sufficient energy for industrial applications such as cement, aluminum, glass and steel.

Our trough have a low profile option 1.4 meter from the ground and can we secured with storm netting that will allow them to survive Category 5 Hurricane. They can continue to collect infrared energy with the storm nets providing a solution of storm and hurricane prone regions. Unlike other collectors our units collect in low visibility situation and any inhabited areas of the planet.

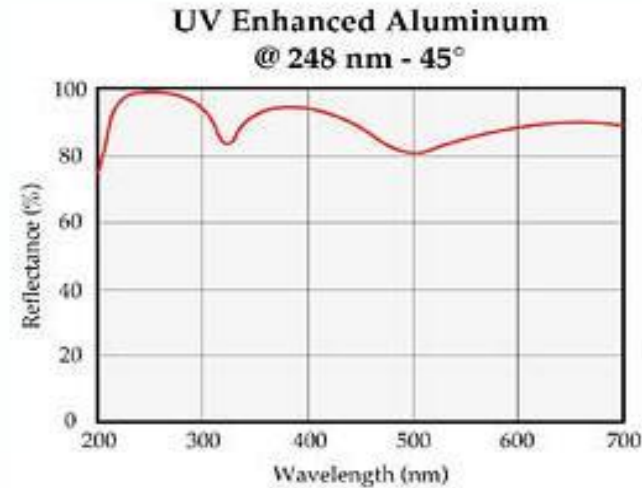
We can Adapt any Solar Thermal of collect the Full Solar Spectrum

- We use a combination of reflective films, either as a substrate of primary aluminum or silver based mirrors. The pervasive infrared is reflected by our substrate back to the receptor and is not lost as heat to the atmosphere
- We can replace the mirrors with our multilayer full spectrum mirrors which includes, Nano-gold for IR reflection over 6000 um, silver for visible. UV and near IR, dialectic glass which totally seals the mirror from any moisture and reflects all shortwaves.
- We add our multilayered receptor which absorbs solar radiation from shortwave to over 6000 um, has a unique light trap which limits radiation reflecting back into the atmosphere and a solid state thermal transfer system which transfers collected energy a better than 2000 w/m², to storage or where it is needed.

Why Gold Reflects Infrared Radiation



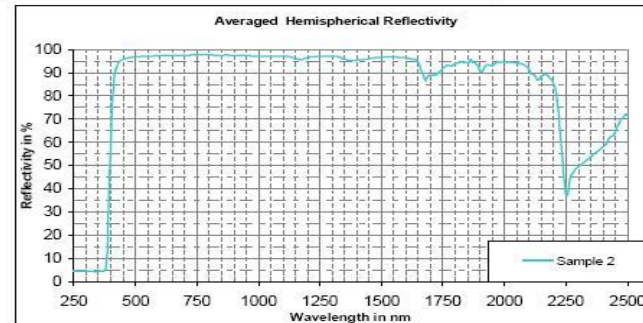
Gold at the top has a more compact atomic structure than silver or aluminum mirrors



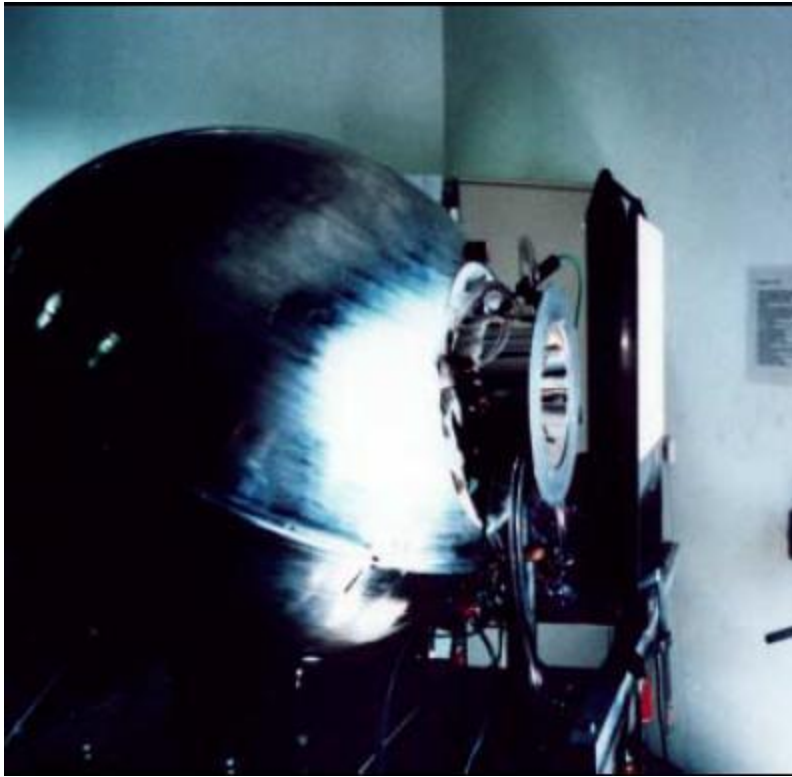
3M film silver based independently tested by DLR

DLR Quarz Evaluation Report Reflectivity 

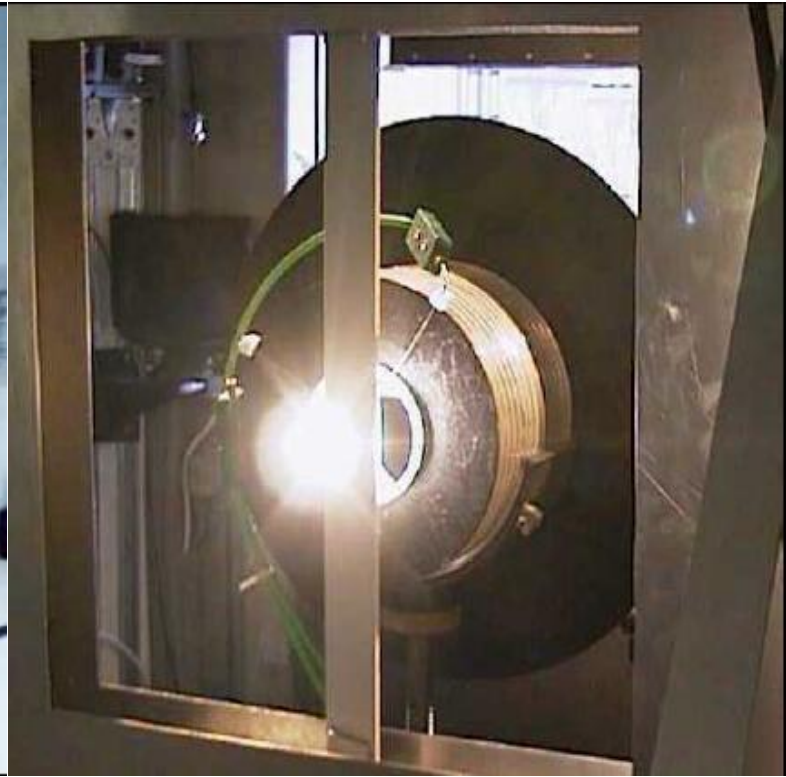
Measurement information					
Sample ID	20100203_02		Meas date	04.02.2010	
Sample name	Sample 2		Reference	OceanSSH-182	
Sample type	1st surface foil		Comment	0	
Manufacturer	3M		Operator	St Meyen	
Initiator	3M		Check	E. Lüpfer	
Results					
Solar norm	P _{SWH}	Stdv	P _{SW025}	Stdv	P _{SW025}
ASTM G173-03	0,929	0,002	0,914	0,002	0,960
ISO 9050	0,920	0,002	0,906	0,002	0,975



Multilayered Receptors with Light Traps



Receptor for Dishes with
Spherical Light Trap collect 92%
of energy that is focused on it



Receptor for Troughs with
Tubular Light Trap collects 78%
of the energy focused on it

The Holy Grail

The method to conserve energy and make intermittent energy sources sustainable. **AIE's** Thermal Storage Unit



Many decades ago and is still the case today, these torpedo shaped railroad cars are carrying molten steel for hundreds and in some cases hundred of kilometers. The metal within these “iron boats”, as they are often referred to, remains molten during the many days of transport.

This technology was first developed at the end of the 19th century, and carriers such as is so efficient in containing the thermal energy that a man can safely touch the outside of one of the storage units with protective gloves. The many tons of metal that are stored within this containment, represents billions of mega joules of stored thermal energy.

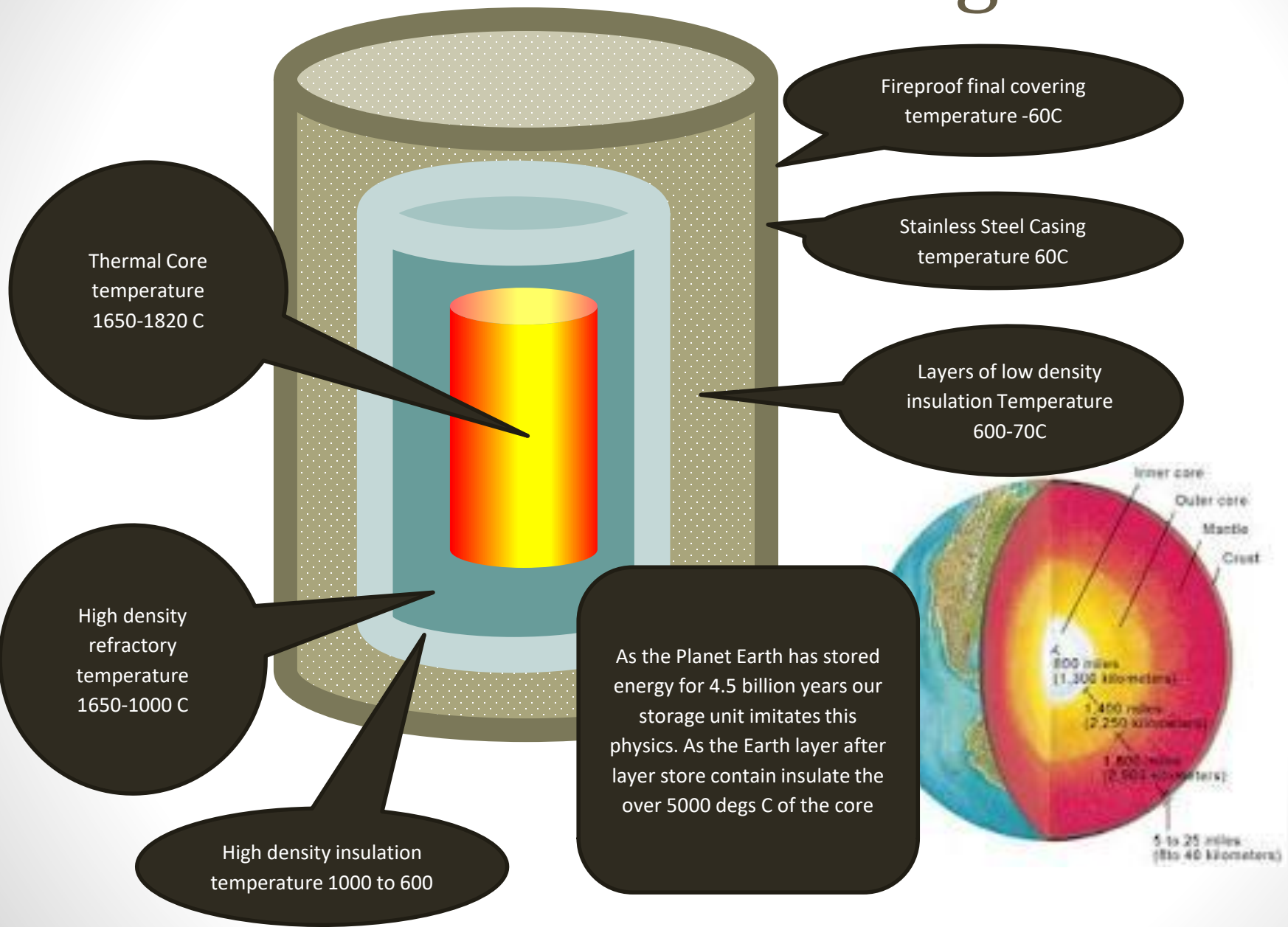


Hybridized Thermal Storage System

“An innovative thermal storage system that integrates high density phase change material, ceramics, as well as graphite in a solid-state storage system”

Days and Weeks.... not hours of stored Energy

How our storage works



How <>Sustainable Innovation

- Solid State Thermal Transfer System which can be designed operate up to 2600 degs C (present operating units up to 1820 degs C (patented)
- Solid State Heat exchanger which can be designed to operate up to 2600 degs C (present units tested and operating up to 1820 degs C (patented)
- “State of the Art thermal management”, collection, delivery, containment and thermal management (patented)
- Existing innovative devices: an energy extraction system that removes energy from molten metals and slag as well as stores this energy in our advanced thermal storage units (patented) Portable high temperature thermal storage that can deliver energy over long distances. (patent pending)
- Flexibility and the ability to adapt our solutions to various industries
- Solar collectors which collect UV-IR wave length making 24/7 solar a reality (patent pending)

Virgil Perryman Patents

Thermal energy storage and delivery system

Patent number: 9115937

Abstract: A thermal energy storage and delivery system is disclosed. A core includes a thermal storage medium and a thermal transfer medium that transports thermal energy to and from the core. The core may be surrounded by multiple layers, where each layer is less dense the closer the layer is to the outside of the thermal storage and delivery system.

Type: Grant

Filed: January 30, 2012

Date of Patent: August 25, 2015

Inventor: Virgil Dewitt Perryman

Non-Tracking Solar Radiation Collector

Publication number: 20130233299

Abstract: A solar collection system includes a double parabolic reflector and a light trap. The solar collection system also includes a lens configured to receive light from the double parabolic reflector and focus the reflected light into the light trap. The system may be configured to resist seismic activity and extreme weather conditions.

Type: Application

Filed: March 30, 2012

Publication date: September 12, 2013 Inventor: Virgil Dewitt Perryman

OUR SOLAR SOLUTION IS BASED ON TECHNOLOGIES PROVEN FOR DECADES AND ONLY SOURCED FROM MAJOR SUPPLIERS

- 3m Film 14 years of extreme testing and has average reflectance of over 95% of the visible spectrum we add a substrate reflective mirror which reflects 99% of infrared spectrum providing full spectrum reflectance-this facilitates solar collection 24/7
- Rath have over 95 years experience with thermal containment and refractories and can contain temperature of over 1750 degree C - Earth Power storage unit contains energy of 1650 degrees C
- Posco the among the largest steel manufacture on the planet will Engineer, Procure , Construct , Commission, Operate and provide Maintenance
- Kawasaki Turbine and Rolls Royce will Engineer, Manufacture, and Commission, turbine regeneration type system for small applications and combine cycle Hot Gas Turbine based on technology that has been in production for years.
- Numerous off the shelf steam boiler and turbine manufactures
- All of the other supplier are of the same reliability and world class reputation

Some of our other partners and service provider

Engineering Services



www.ccc.gr

www.alyeinternational.com

www.jacobs.com

www.harrisgroup.com

www.baeac.com

www.allnorth.com

Technology Partners



www.ras.ru

[www.web.wits.ac.za/Academic/](http://www.web.wits.ac.za/Academic/Centres/COMPS/)

Centres/COMPS/

Manufacturing Services



www.wcmrapid.com

www.Lurgi.com

www.man-dwe.de

www.fluor.com

www.uop.com

www.hmttank.com

www.rath-usa.com

www.chasestead.com

Professional Advisors



www.bdo.co.uk



www.polsinelli.com



www.kstrode.co.uk

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empowering the planet

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