

Hot Science Cool Talks

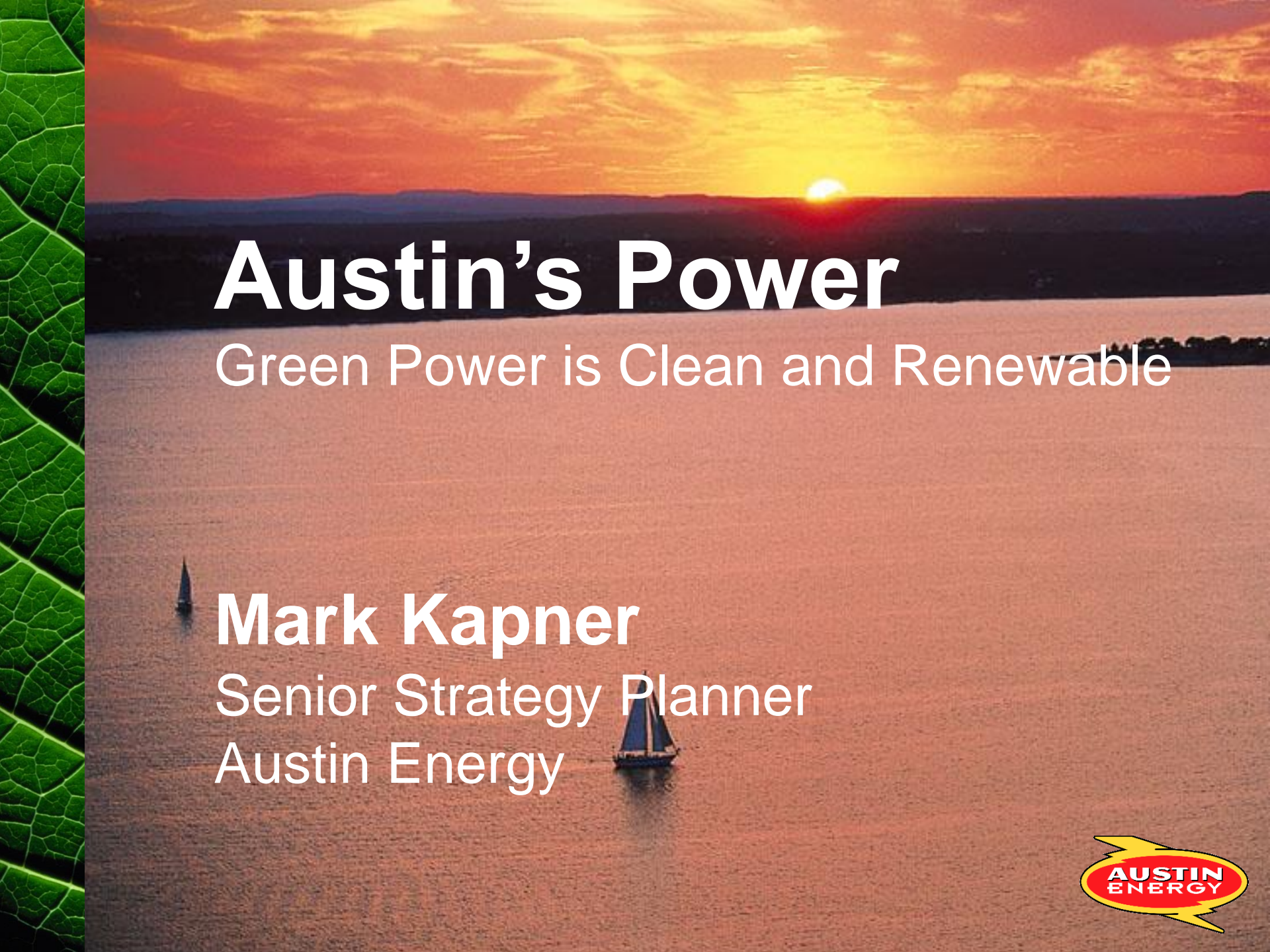
UT Environmental Science Institute

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Austin's Power: Green Power is Clean and Renewable

**Mark Kapner, P.E.
February 13, 2004**

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Austin's Power

Green Power is Clean and Renewable

Mark Kapner

Senior Strategy Planner

Austin Energy



Hydro-Electric



Wind



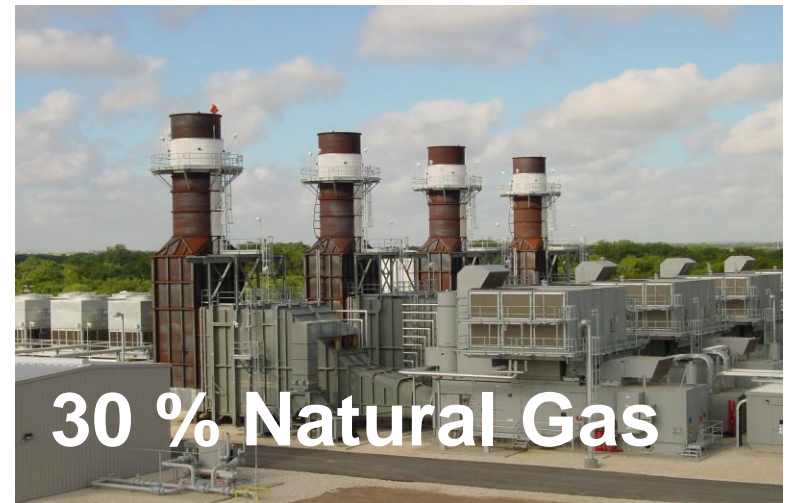
Solar



Bio-Energy



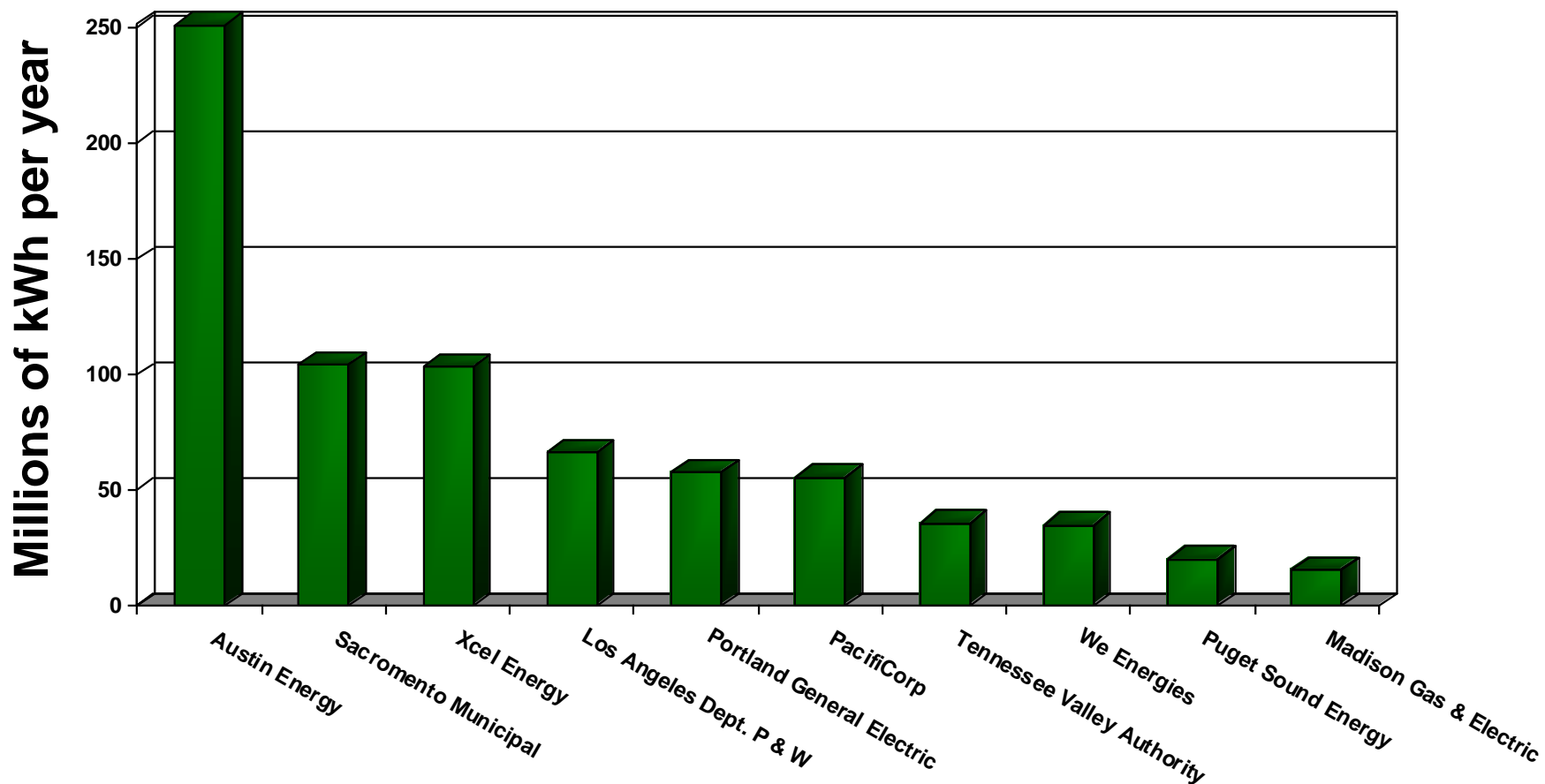
Where Does Austin's Power Come From Today?




Green Pricing Program

Renewable Energy Sales

(as of December 2002)





Austin Energy's Strategic Plan Goals

**By the year 2020, 20% of Austin's energy
will come from renewables!**

**This plan includes a 6-fold increase
in solar electric power.**

Fuel Combustion Emissions

- **NITROGEN OXIDES**
(forms ozone and smog)
- **CARBON DIOXIDE**
(causes global warming)





What Is Renewable Energy?

How Does It Work?

What Does It Cost?

**Can It Replace Conventional Power
Plants?**

What Is The Potential For Texas?

**How Much Land Would It Take To Furnish
1/3 of Austin's Power?**

Hydro Electric



Wind Energy





Wind Turbine Generators

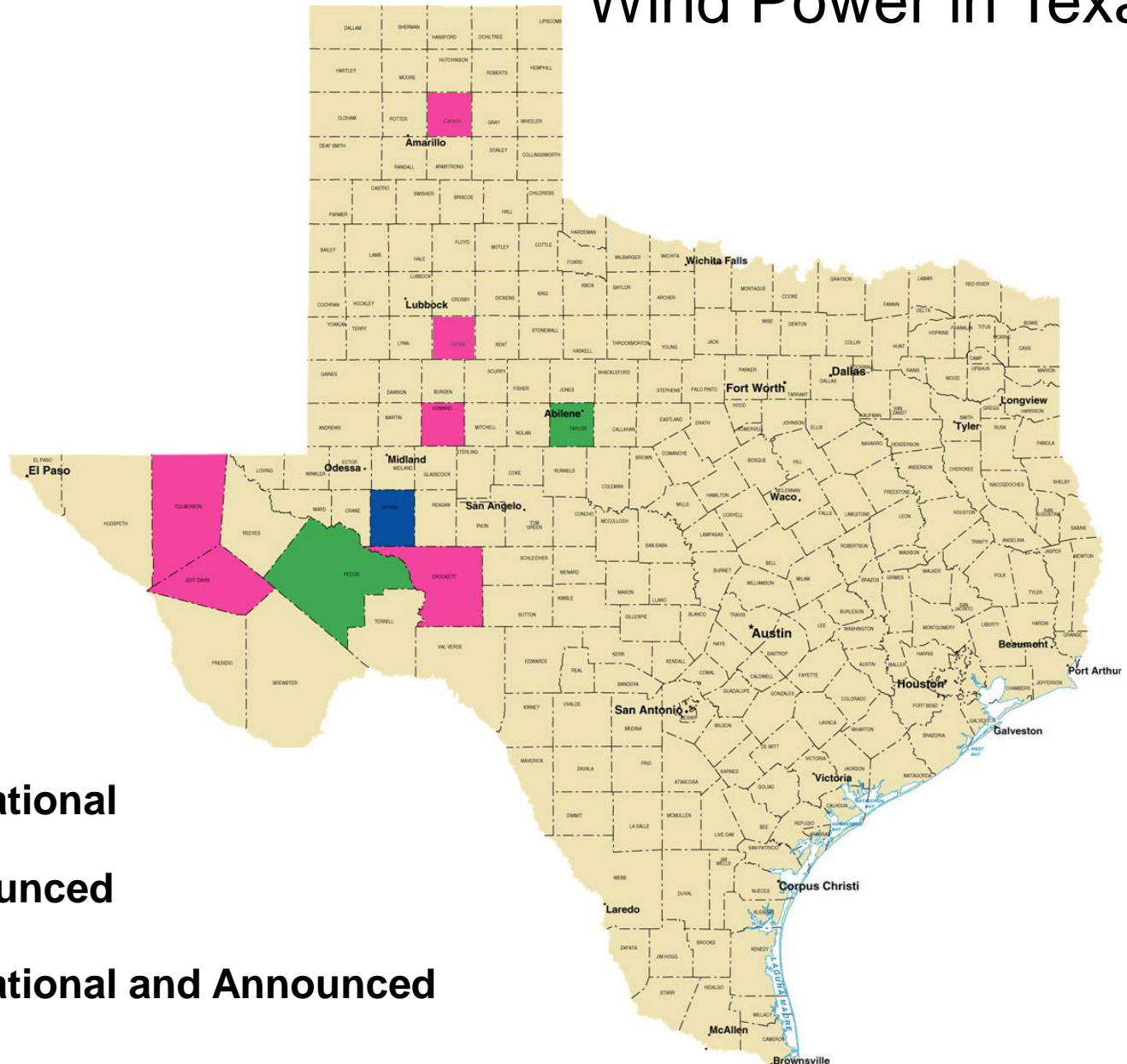
- Located throughout west Texas
- About as tall as the UT Tower
- One turbine generates as much electricity as is used by 350 Austin homes per year.





Wind Turbine Generators

Wind Power in Texas



Operational



Announced

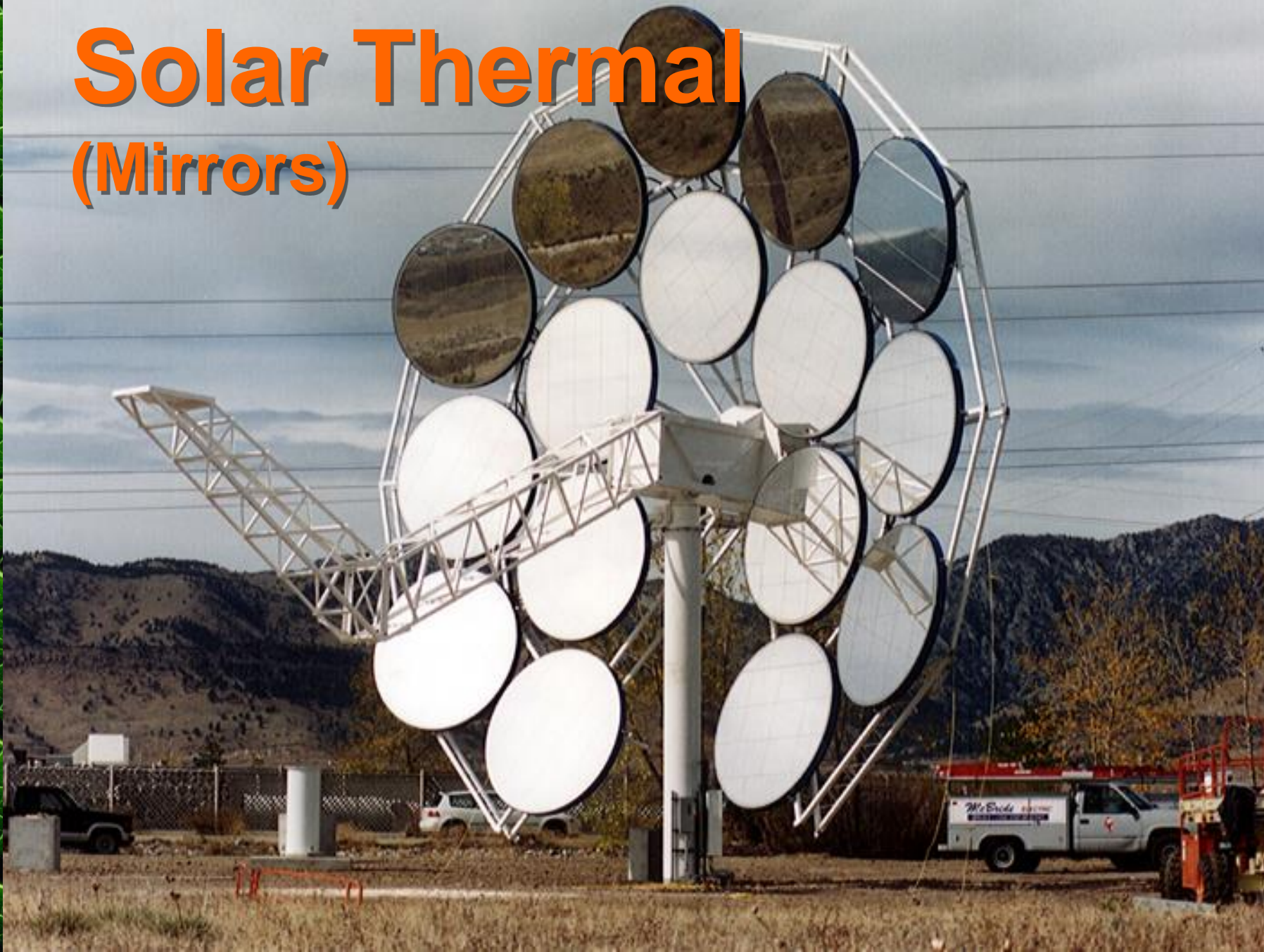


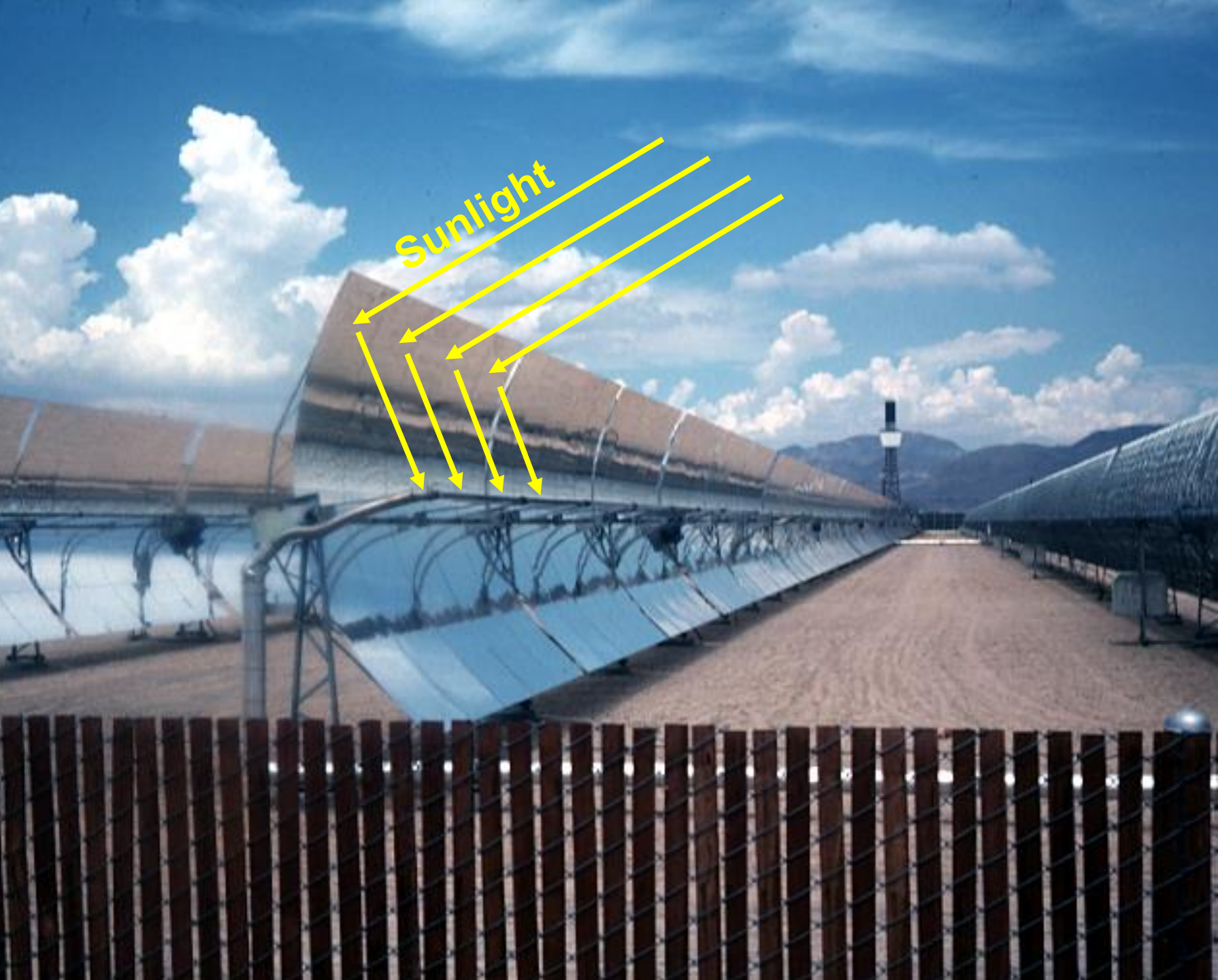
Operational and Announced

Solar Energy

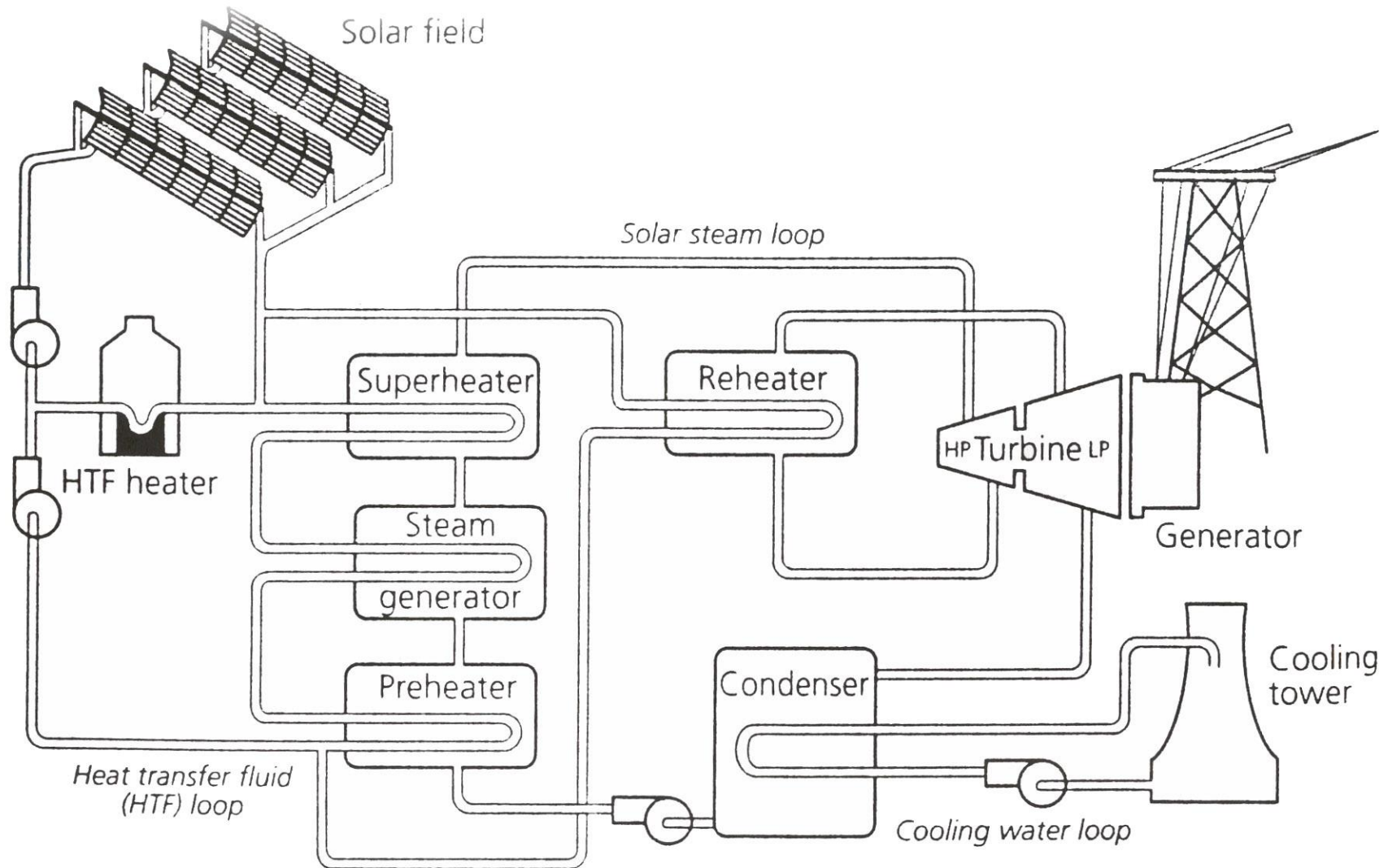


Solar Thermal (Mirrors)



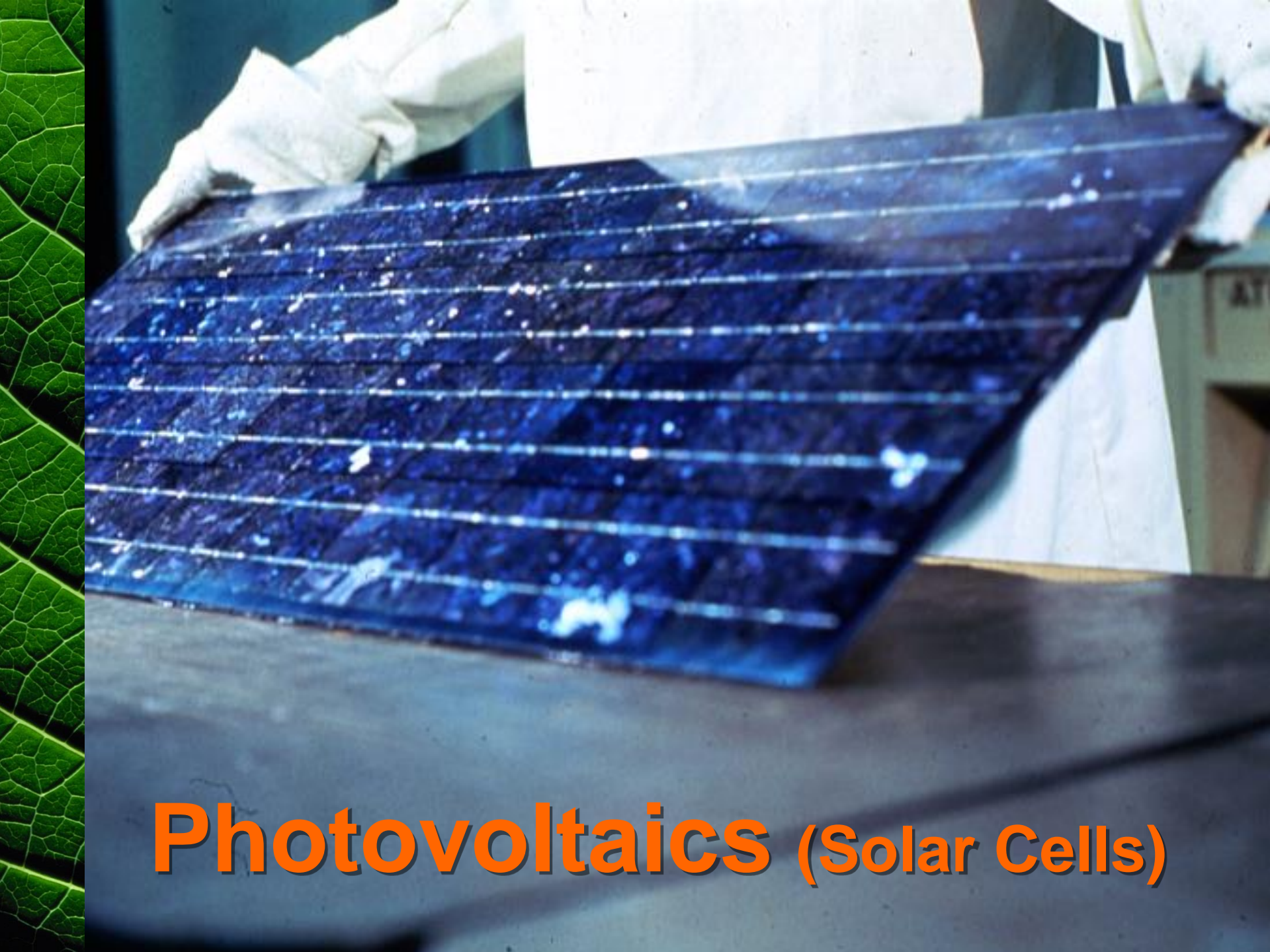


Solar Parabolic Trough (Mojave desert)



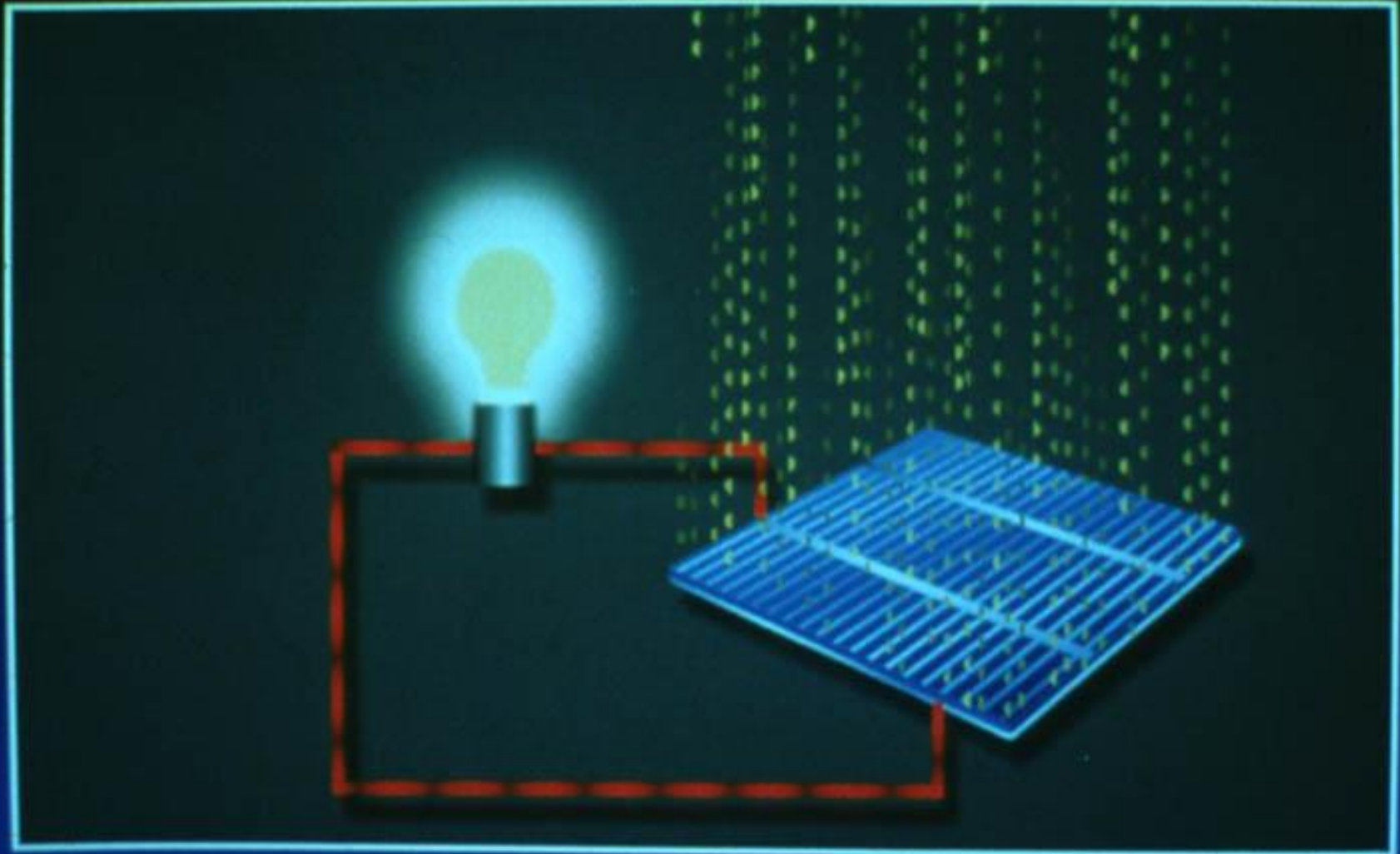


Football Field



Photovoltaics (Solar Cells)

Photovoltaic Energy Conversion



Power Without A Wire

less expensive than
a line extension













An aerial photograph of a wood-fired power plant. In the foreground, a large, reddish-brown pile of wood chips or mulch is visible. A conveyor system leads from this pile towards the plant. The plant itself consists of several green buildings, including a tall smokestack and a large central structure. A large plume of white steam or smoke rises from a smaller building on the left. In the background, a blue river flows under a green truss bridge. The surrounding area is forested with green trees.

Bio-Energy

Wood-Fired Power Plant

Agricultural Residue





Energy Crops

Switchgrass

Bio-Gas



Kilowatts From Cows



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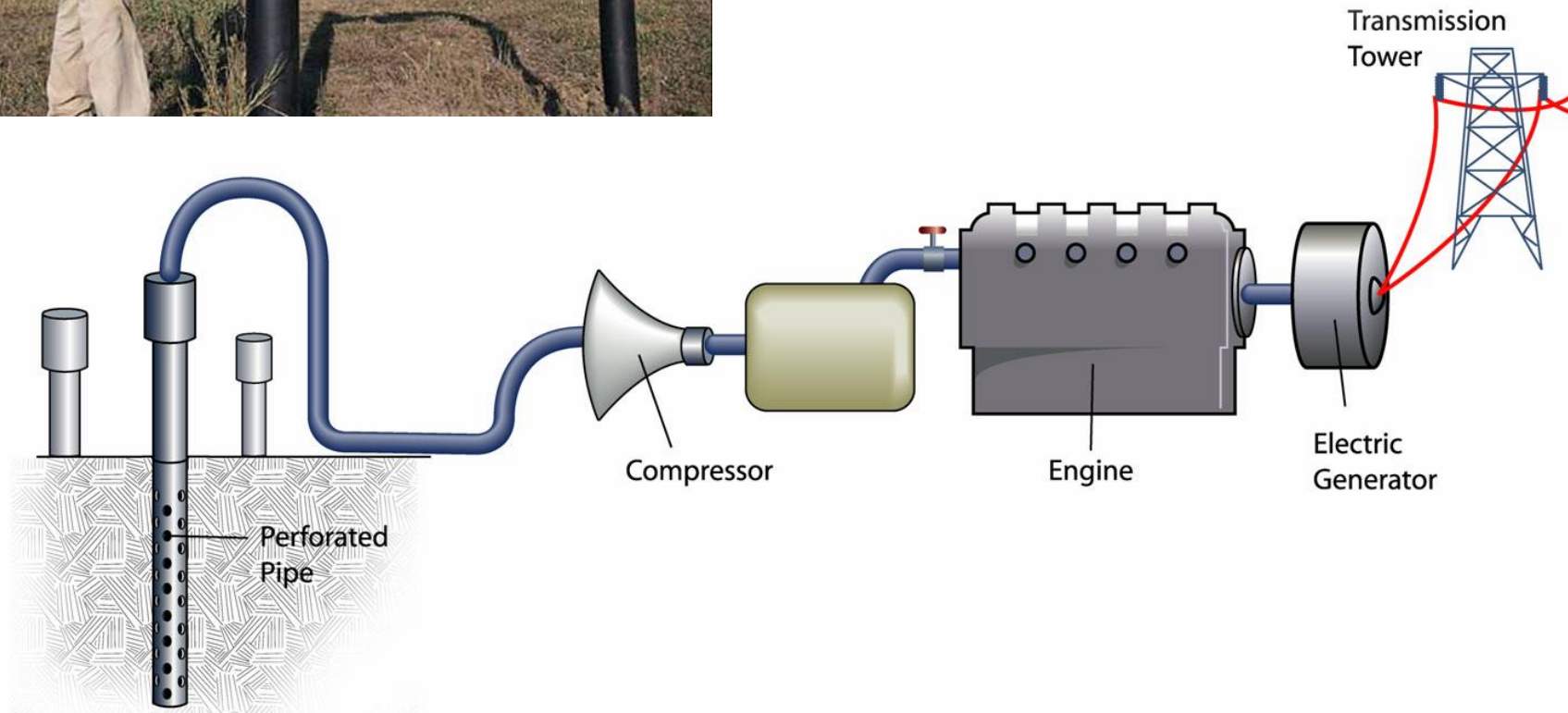
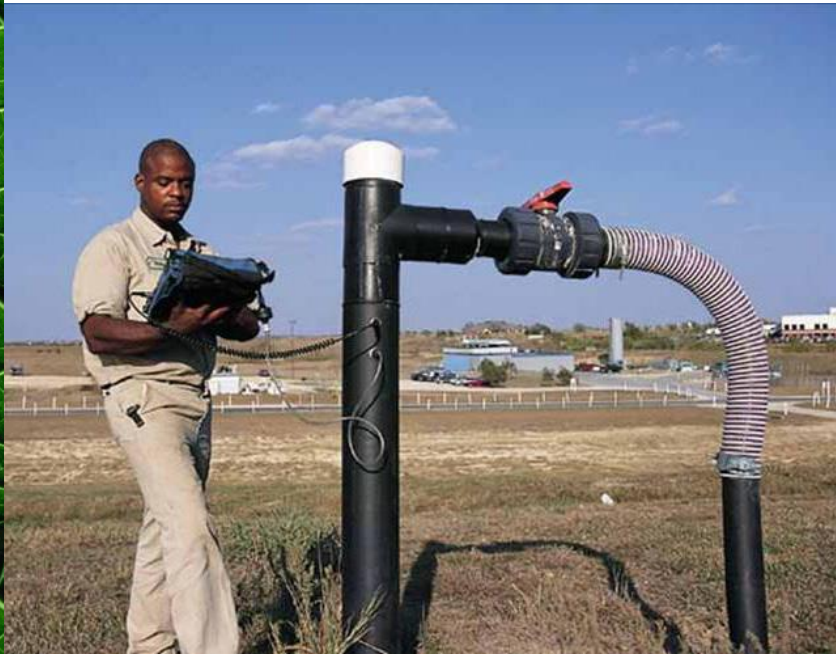
Waste disposal
problem is turned
into a renewable
energy source.



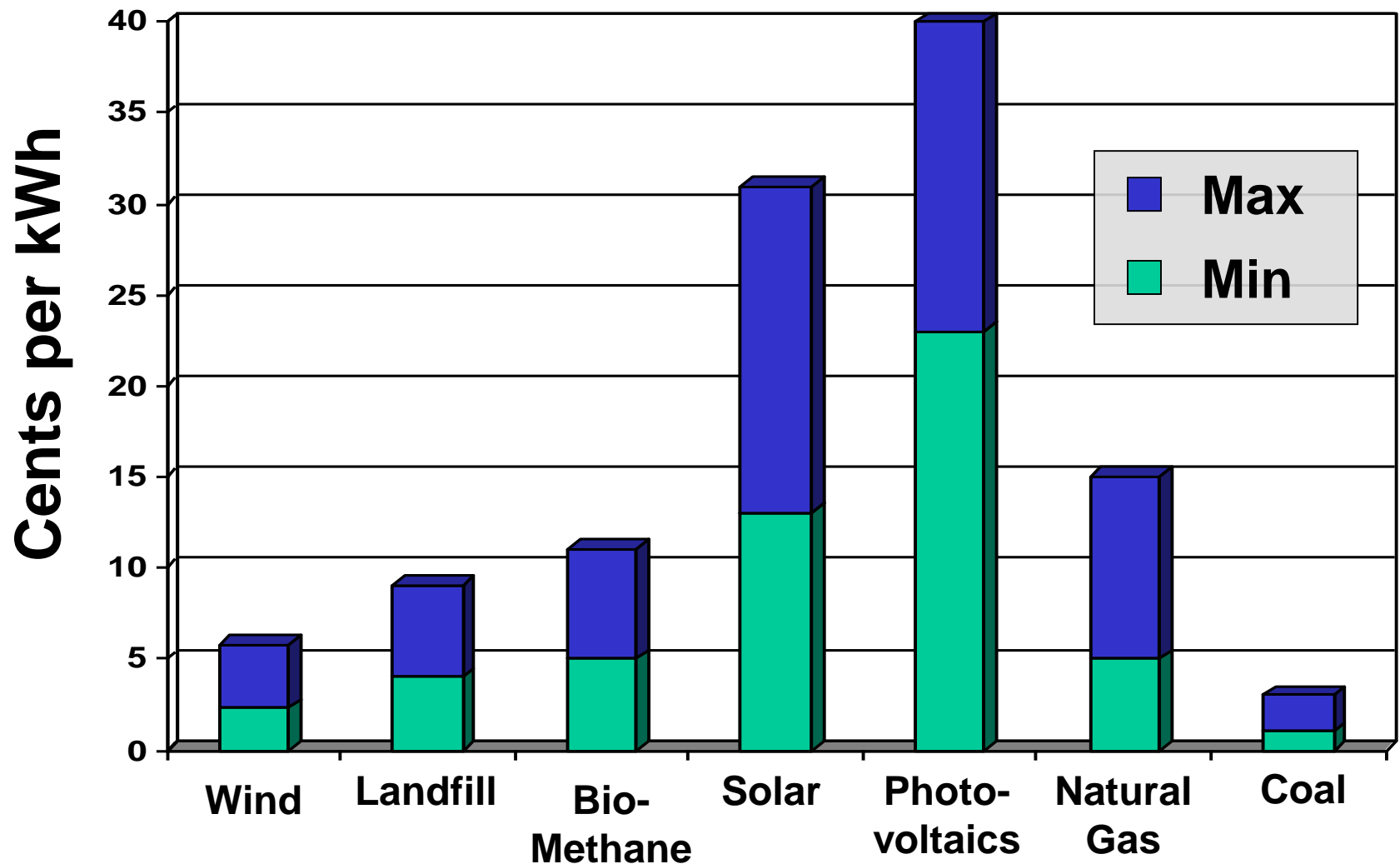
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Photos courtesy
<http://philip.greenspun.com>

Turning Landfill Methane Into Green Power

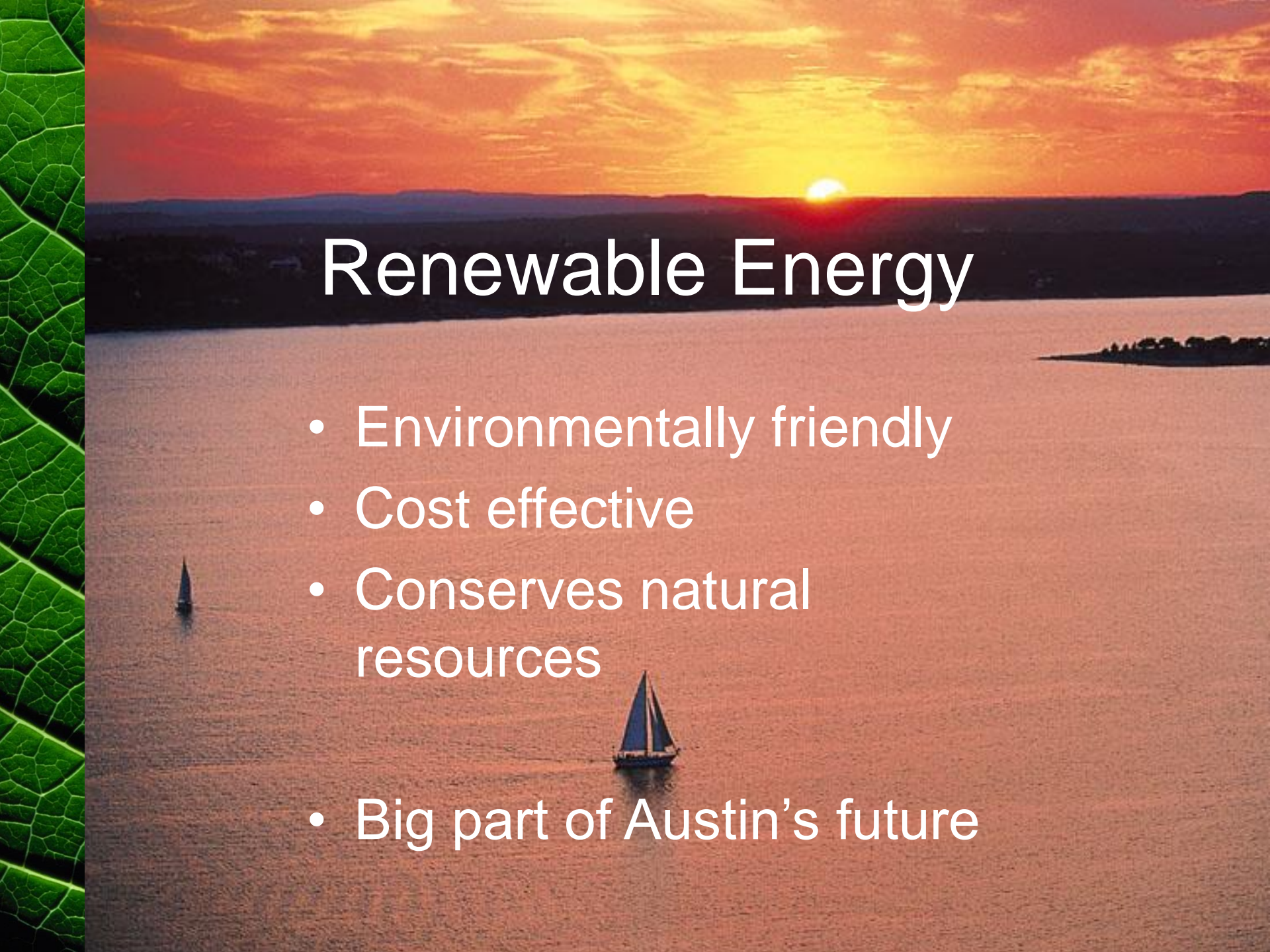


Comparison of Costs



Amount Of Land Necessary To Generate One-Third of Austin's Electricity

Solar PV	4,000 Football Fields	2% of Travis County
Wind	22,000 Football Fields	9% of Travis County
Bio-Energy	130,000 Football Fields	50% of Travis County

The background of the slide is a photograph of a sunset over a calm body of water. The sun is a bright yellow-orange orb on the horizon, casting a long, shimmering reflection across the water's surface. The sky is filled with soft, wispy clouds in shades of orange, red, and yellow. In the foreground, two sailboats are visible on the water; one is further away on the left, and the other is closer in the center. The water reflects the colors of the sunset. On the far left edge of the slide, there is a vertical strip showing a close-up of a green leaf with prominent veins.

Renewable Energy

- Environmentally friendly
- Cost effective
- Conserves natural resources
- Big part of Austin's future

Mark Kapner, P.E.



Mark Kapner, P.E., has been Manager of Conservation and Renewable Energy at Austin Energy since 1999. He was instrumental in developing and running Austin's Green Choice Program, the nation's leading renewable energy marketing program. He has 30 years of experience in energy technology and environmental engineering and policy. Prior to coming to Austin, Kapner launched TerraSolar USA, a solar photovoltaics company based in New Jersey. He was a research and development manager in the New York Power Authority where he developed demonstration projects in energy storage, biomass energy, solar, and cogeneration. Kapner spent ten years as a consultant to federal government agencies, including the National Science Foundation, Department of Energy and Environmental Protection Agency. He has a BS in Engineering Science from the State University of New York and a Masters in Public Policy and Management from Carnegie Mellon University.