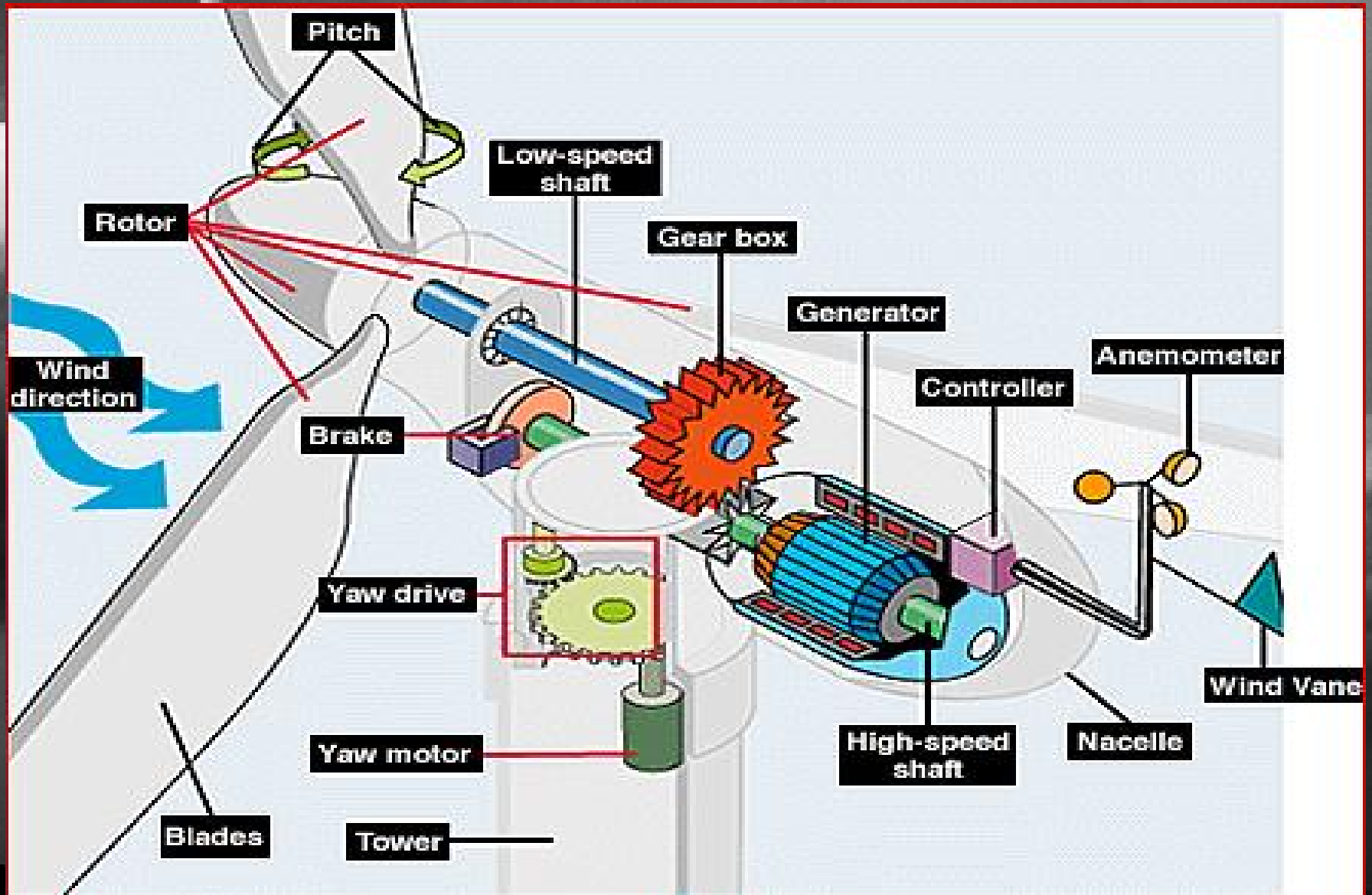


Wind Energy 101 (With Some Solar Flair)

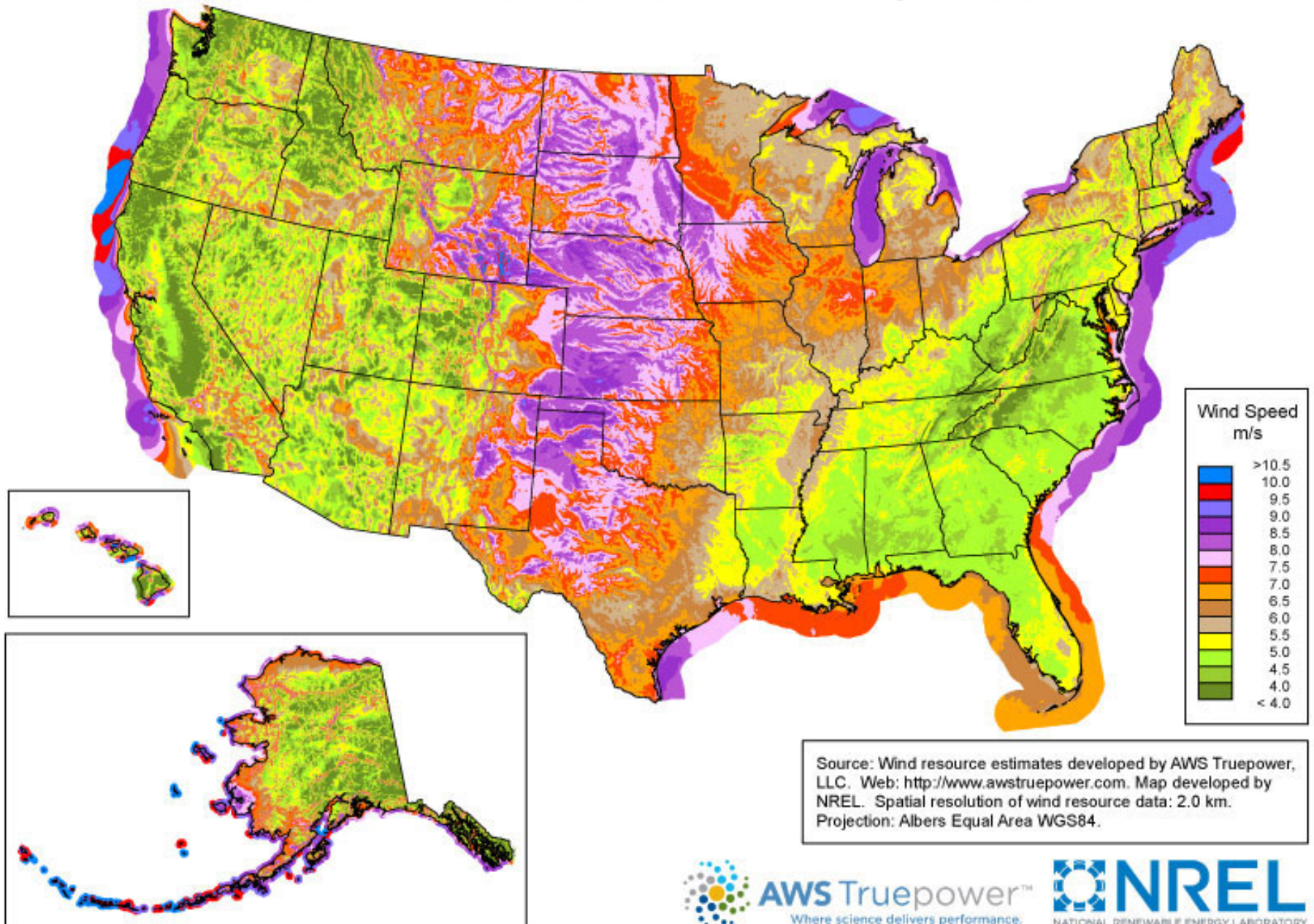
Idaho State Bar
Environment and Natural Resources Law Section
February 27, 2013

Gregory S. Friend
Stahl, Bernal & Davies, L.L.P.
www.sbaustinlaw.com

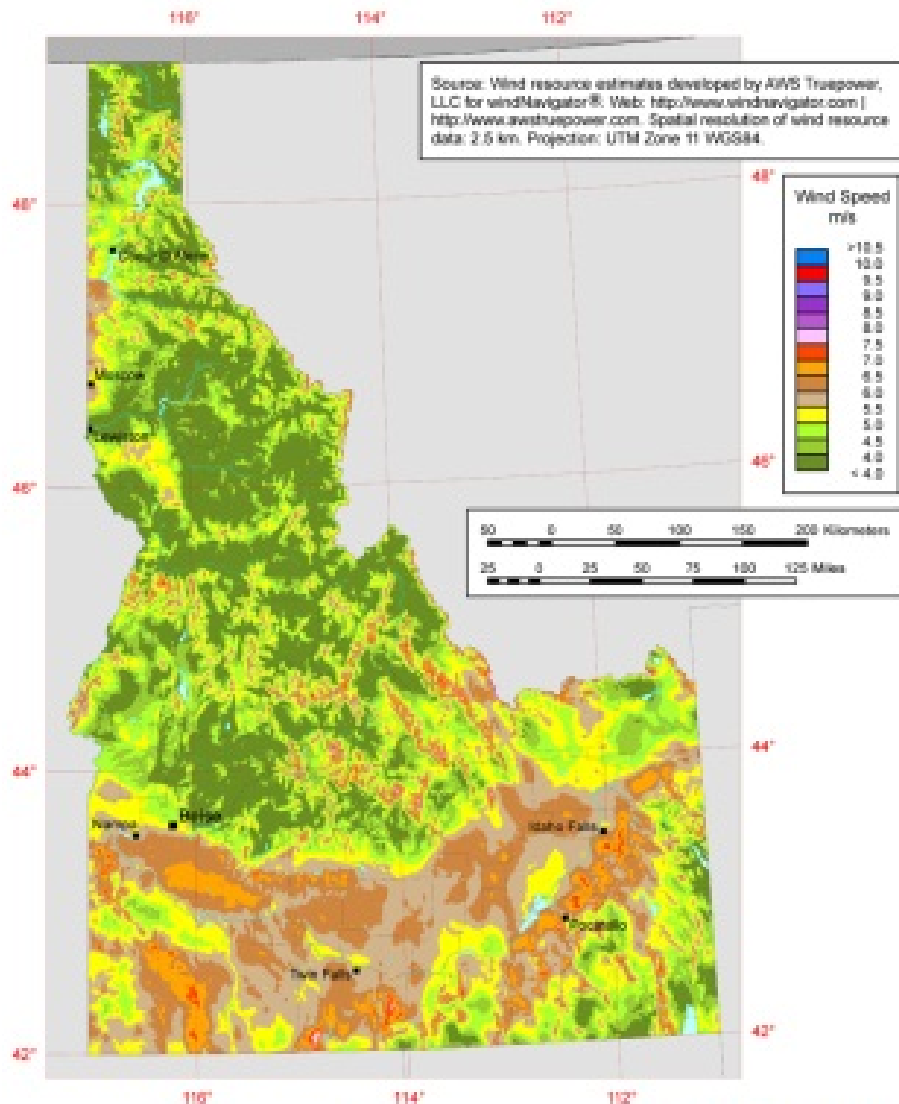
How does it work?



United States - Land-Based and Offshore Annual Average Wind Speed at 80 m



Idaho - Annual Average Wind Speed at 80 m



AWS Truepower™
Where science delivers performance.



NREL
NATIONAL RENEWABLE ENERGY LABORATORY
Boulder, CO

Land Control Arrangement Issues

- Common form is lease or easement
- Existing uses
 - Farming, grazing, hunting, oil and gas
- Payments
- Removal
 - Bond
- Survey and title
- Federal, State, and Local Permitting
- Financing

Environmental Considerations



- Birds and bats
 - Migratory Bird Treaty Act; Bald and Golden Eagle Protection Act; Endangered Species Act
 - Guidelines
 - Permits/HCPs
- Construction Activities
 - Water and stormwater
 - Wetlands

Solar Power - Photovoltaic



How does it work?

**Solar Irradiance
from the Sun**



**Solar
Panel(s)**

**Electric
Current**

**Charge
Controller**



AC Power 



(and/or)

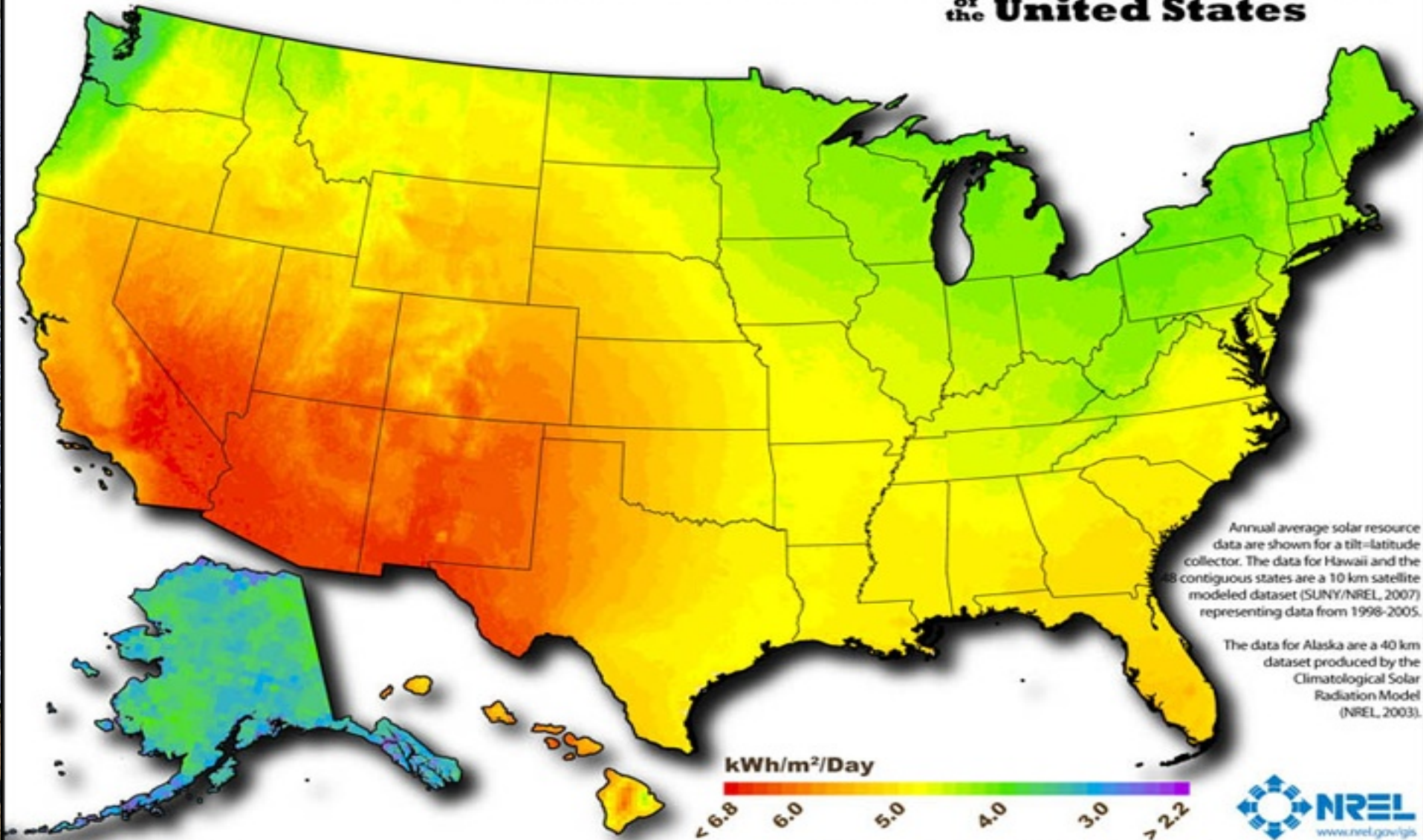


DC Power 

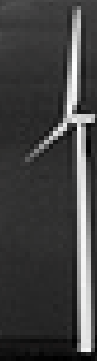
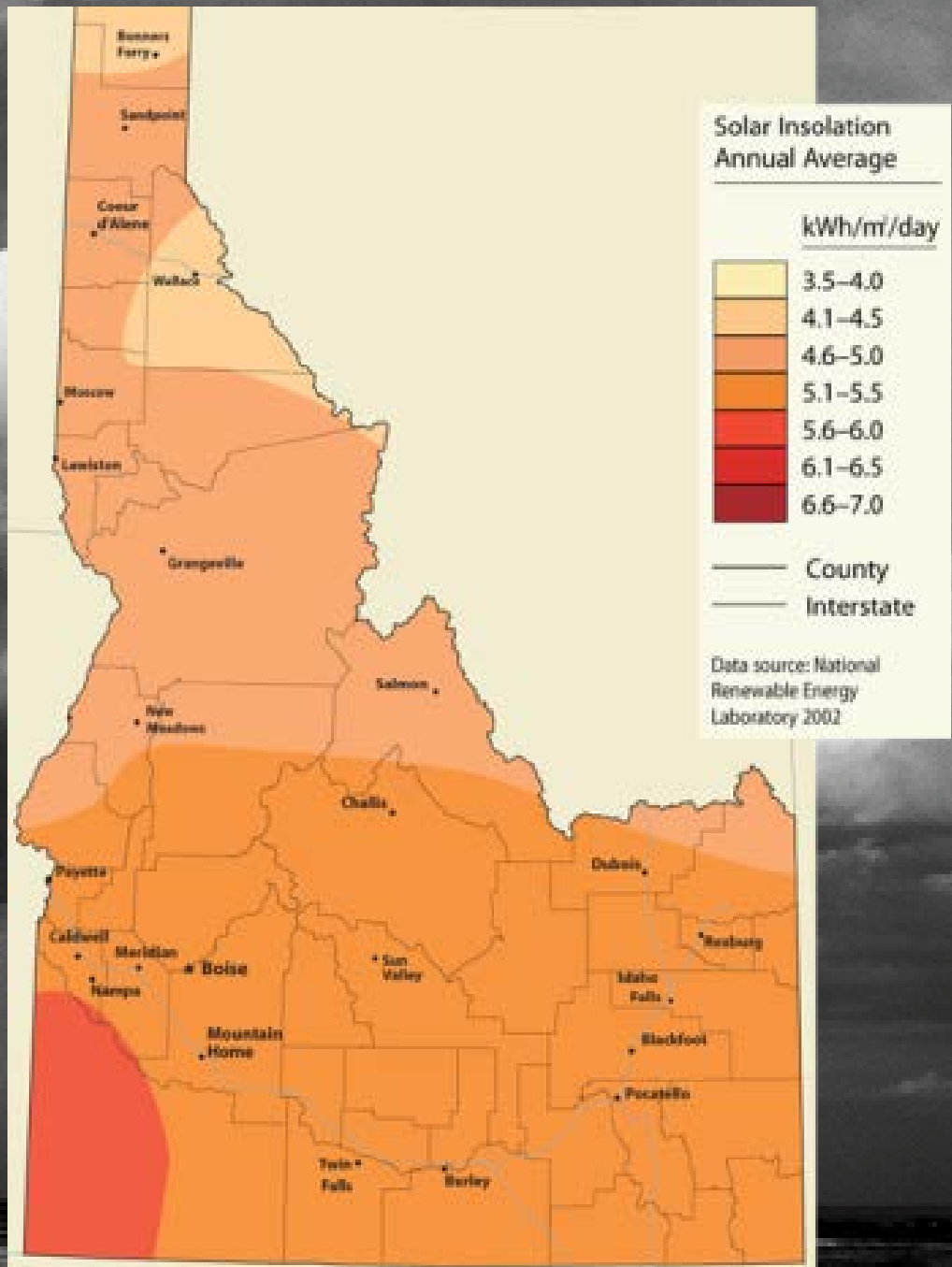


Solar Power - Photovoltaic

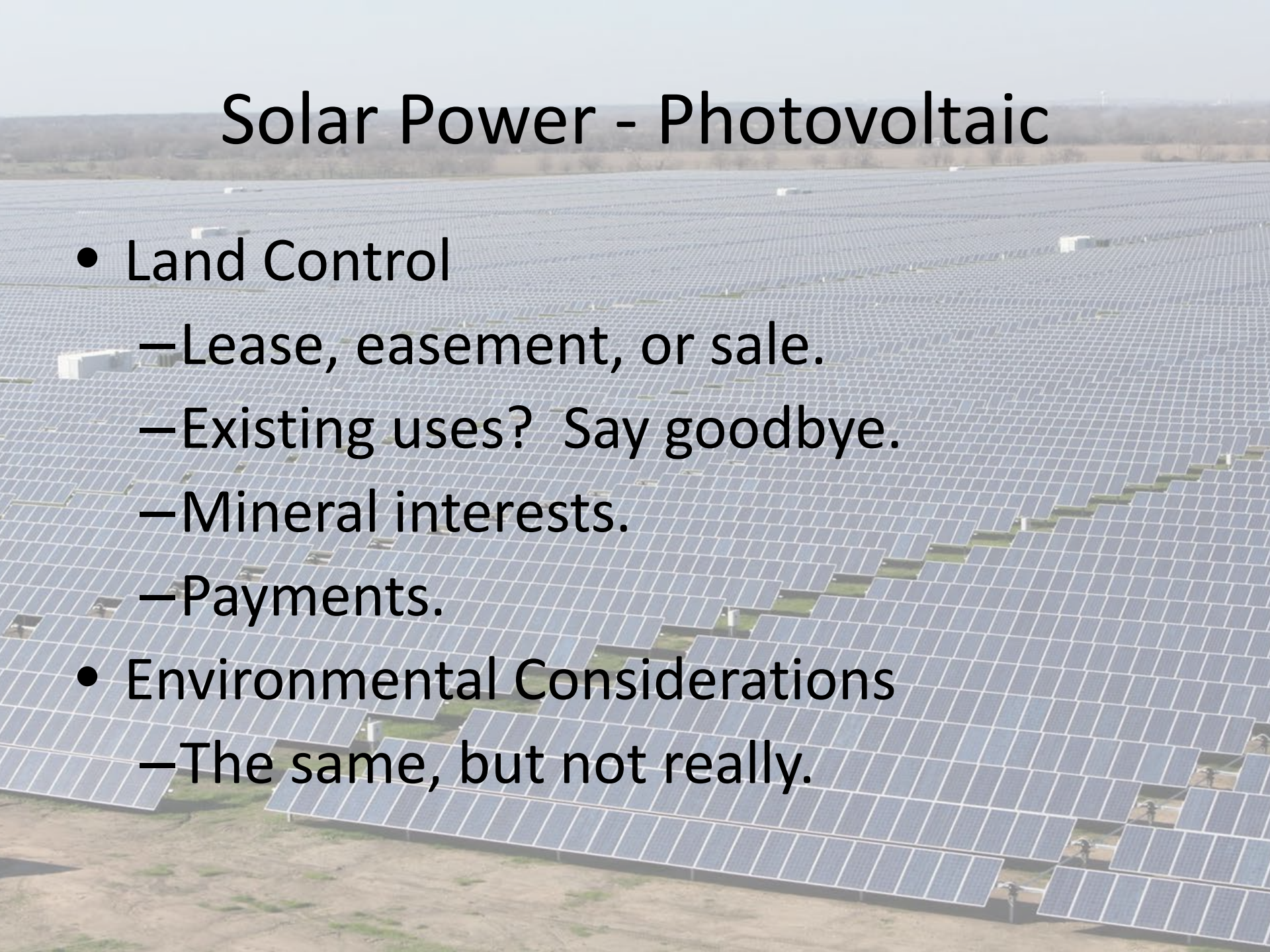
Photovoltaic Solar Resource of the United States



This map was produced by the National Renewable Energy Laboratory for the U.S. Department of Energy.



Solar Power - Photovoltaic



- Land Control
 - Lease, easement, or sale.
 - Existing uses? Say goodbye.
 - Mineral interests.
 - Payments.
- Environmental Considerations
 - The same, but not really.

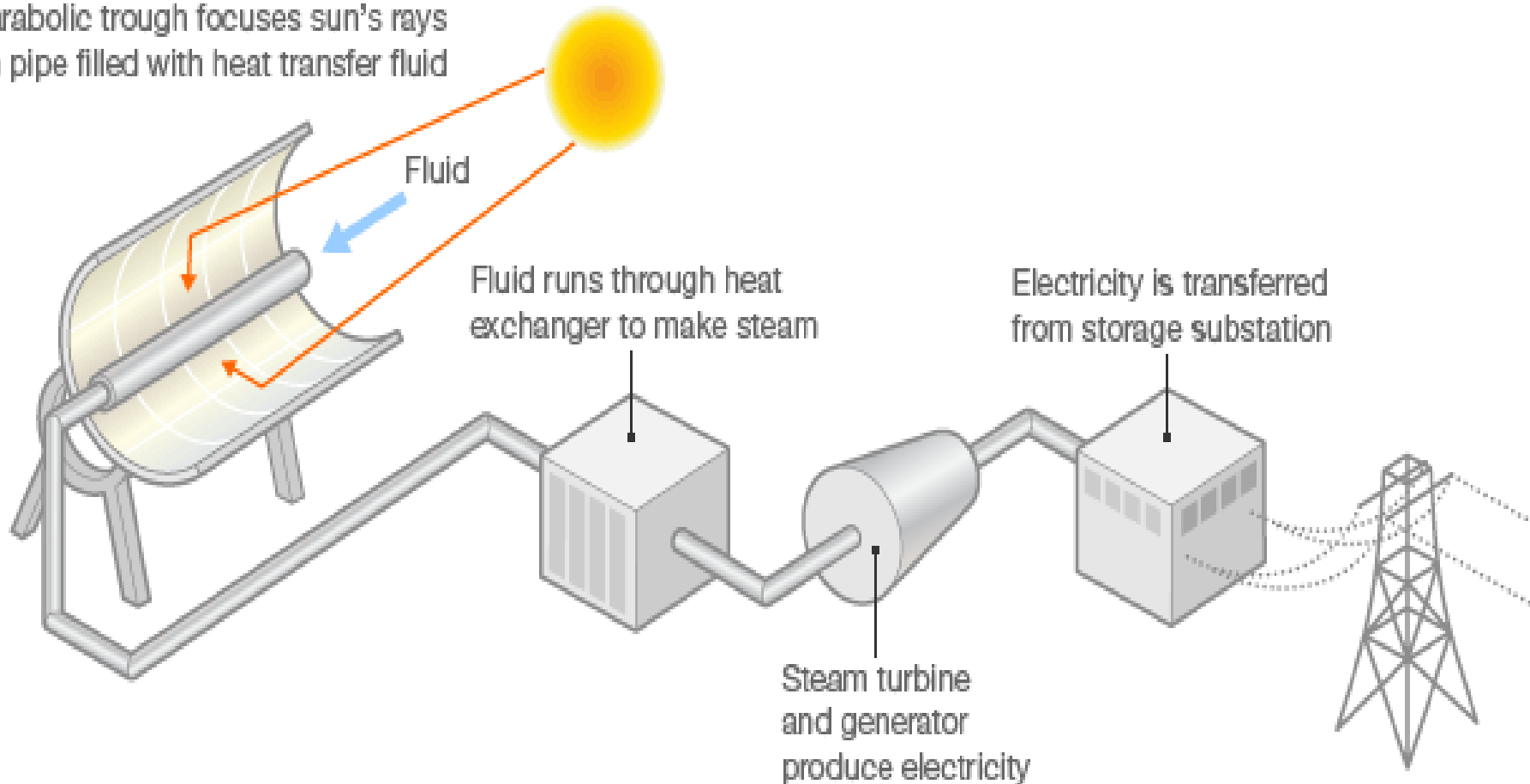


Solar Power - CSP

How does it work?

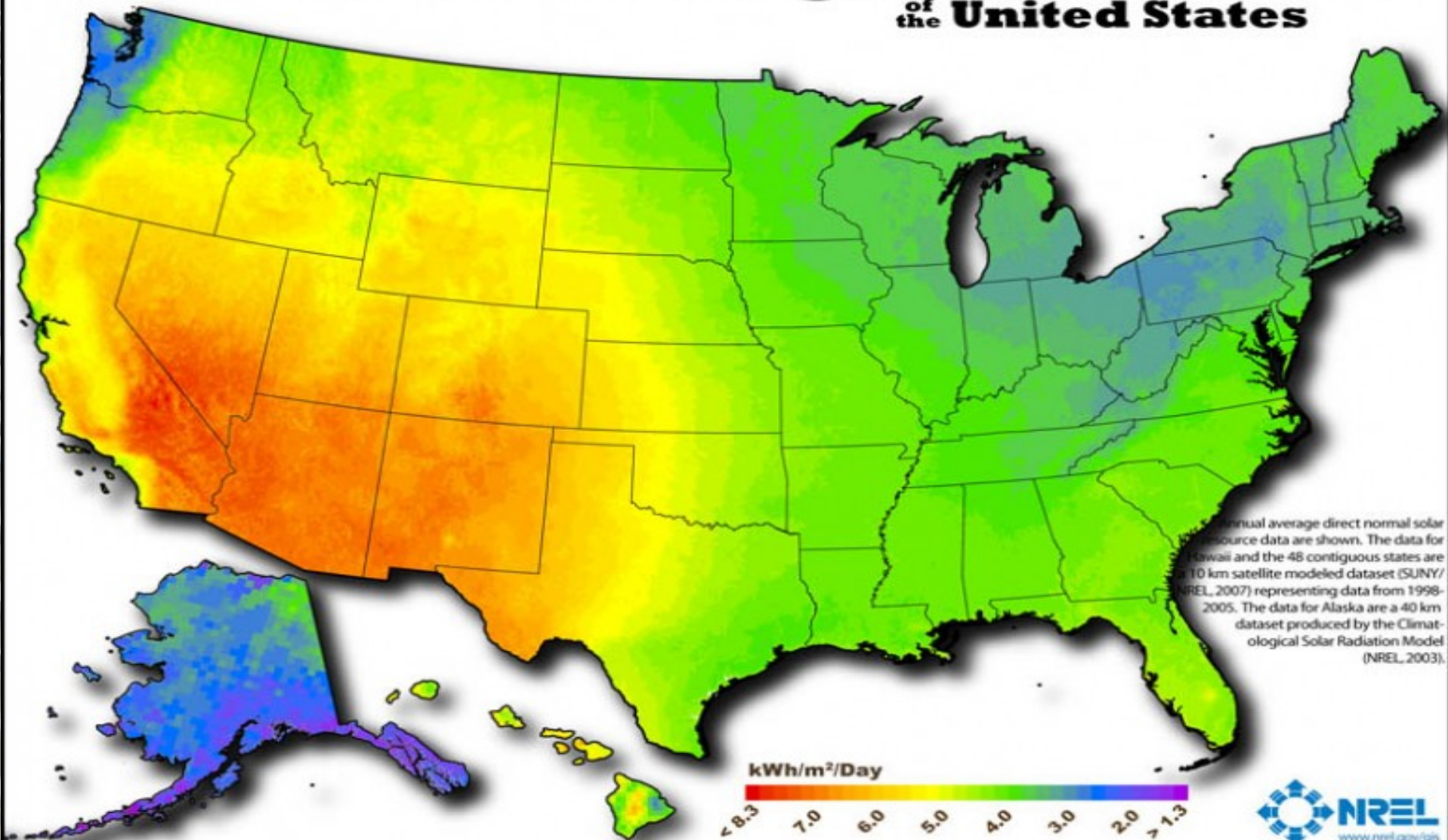
How concentrated solar power works

Parabolic trough focuses sun's rays on pipe filled with heat transfer fluid



Solar Power - CSP

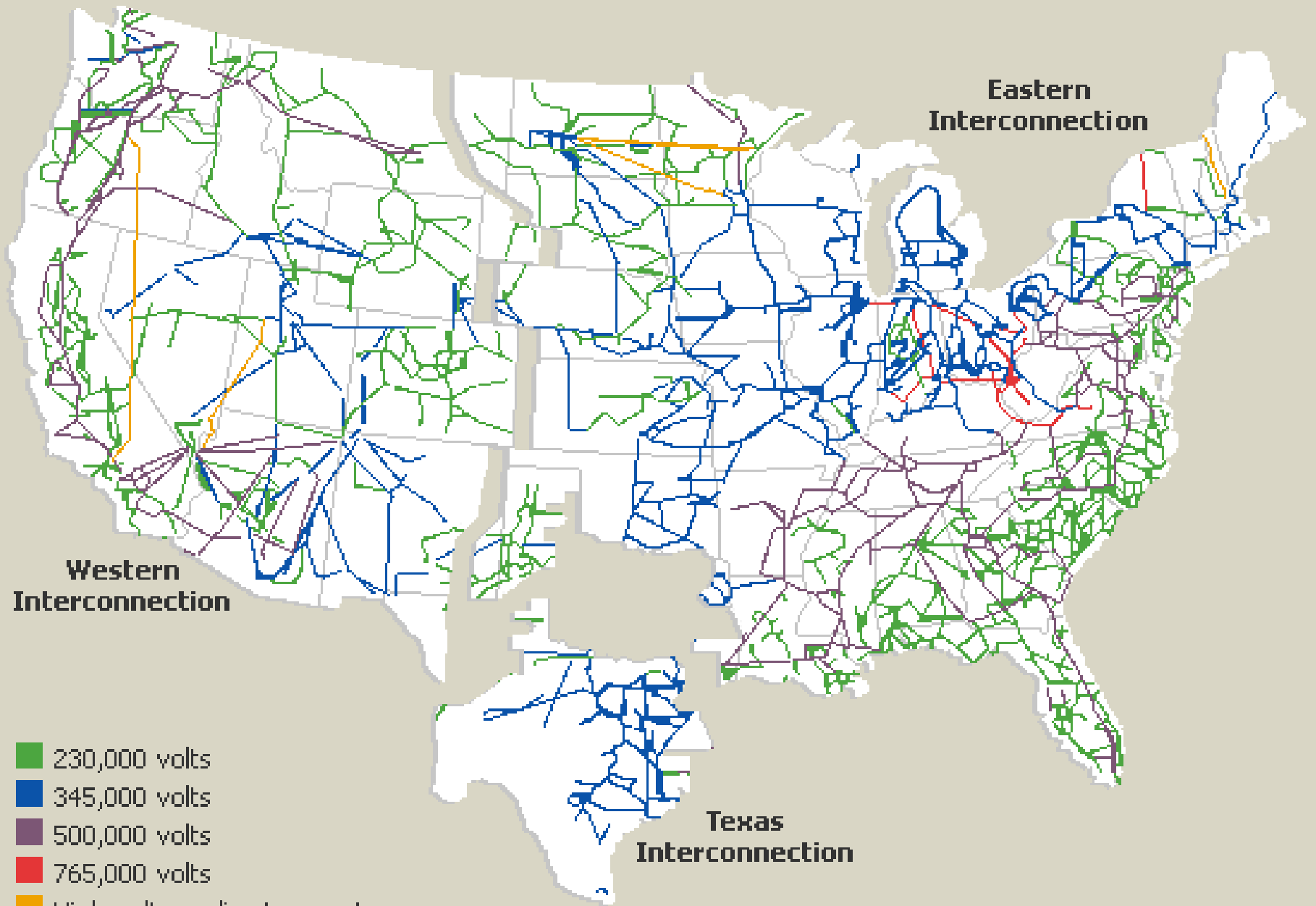
Concentrating Solar Resource of the United States



Solar Power - CSP



- Land Control
 - Water, water, water
- Everything else same as PV



Eastern Interconnection

Western Interconnection

Texas Interconnection

- 230,000 volts
- 345,000 volts
- 500,000 volts
- 765,000 volts
- High-voltage direct current

Which Came First?



Current Trends

- Smart Grid adds monitoring, control, analysis and communication to the grid to maximize throughput and reduce energy consumption.
- Storage of renewable energy
 - Compressed air
 - Batteries
 - Flywheels



Questions?