

Green Energy
January 14, 2008

**CleanTech Job
Creation
Opportunities**

OREGON
ECONOMIC & COMMUNITY
DEVELOPMENT DEPARTMENT

A map of the Pacific Northwest region of the United States, highlighting Oregon in green. The map shows the Pacific Ocean to the west and the states of Washington, Oregon, and California to the east. Three cities are marked with dots: Seattle in Washington, Portland in Oregon, and San Francisco in California. The text 'OREGON STRATEGICALLY LOCATED' is at the top, and 'FOR MORE INFORMATION: WWW.OREGON4BIZ.COM' is at the bottom.

OREGON
STRATEGICALLY LOCATED

Pacific Ocean

Seattle

Portland

San Francisco

FOR MORE INFORMATION:
WWW.OREGON4BIZ.COM

Presentation Overview

CleanTech Cluster

- Beginning of the end of the fossil fuel era
- Economic Opportunity
- Brief look at the technology categories
- State Policy positions around the change
- Solar Opportunity
- What's out there in Renewables

What's Driving The Change?

- High Price Oil
- Volatile Energy Markets
- Security Concerns
- Climate Change: Greenhouse Gases
- Jobs, Technology & Wealth Creation Opportunity





CleanTech Definition

- Provide superior performance at lower costs
- Greatly reduce or eliminate negative ecological impact

CleanTech Defined

11 segments

- **Energy Generation**
 - Wind
 - Solar
 - Hydro/Marine
 - Biofuels
 - Geothermal
 - Other
- **Energy Storage**
 - Fuel Cells
 - Advanced Batteries
 - Hybrid Systems
- **Energy Infrastructure**
 - Management
 - Transmission
- **Energy Efficiency**
 - Lighting
 - Buildings
 - Glass
 - Other
- **Transportation**
 - Vehicles
 - Logistics
 - Structures
 - Fuels
- **Water & Wastewater**
 - Water Treatment
 - Water Conservation
 - Wastewater Treatment
- **Air & Environment**
 - Cleanup/Safety
 - Emissions Control
 - Monitoring/Compliance
 - Trading & Offsets
- **Materials**
 - Nano
 - Bio
 - Chemical
 - Other
- **Manufacturing/Industrial**
 - Advanced Packaging
 - Monitoring & Control
 - Smart Production
- **Agriculture**
 - Natural Pesticides
 - Land Management
 - Aquaculture
- **Recycling & Waste**
 - Recycling
 - Waste Treatment

State of Oregon Policy and Legislation

- Climate Change Initiatives
 - Global Warming Advisory Group (2004)
 - GHG reduction strategy
 - Climate Change Integration Group (2006)
 - Build on GWAG and develop adaptation strategy
 - Western Climate Initiative (2007)
 - OR, WA, CA, NM, AZ, UT, BC, Manitoba
 - Carbon Cap & Trade Agreement
 - Global Warming Commission (2007)
 - Established by HB3543 which codifies GHG reduction goals
 - Governor accelerates goal for State to purchase 100% renewables by 2010

State of Oregon

Policy and Legislation

- Energy Legislation - '07 Session
 - SB838 Renewable Portfolio Standard (RPS)
 - Utilities to provide 25% of electricity from renewables by 2025
 - HB2210 Biofuels Package
 - Property tax incentives, tax credits for producers, collectors, consumers
 - Renewable Fuel Standard (RFS)
 - HB2211 and HB2212 BETC and RETC (both rolled up into HB3201)
 - Increases BETC to 50% for renewables
 - Expands RETC



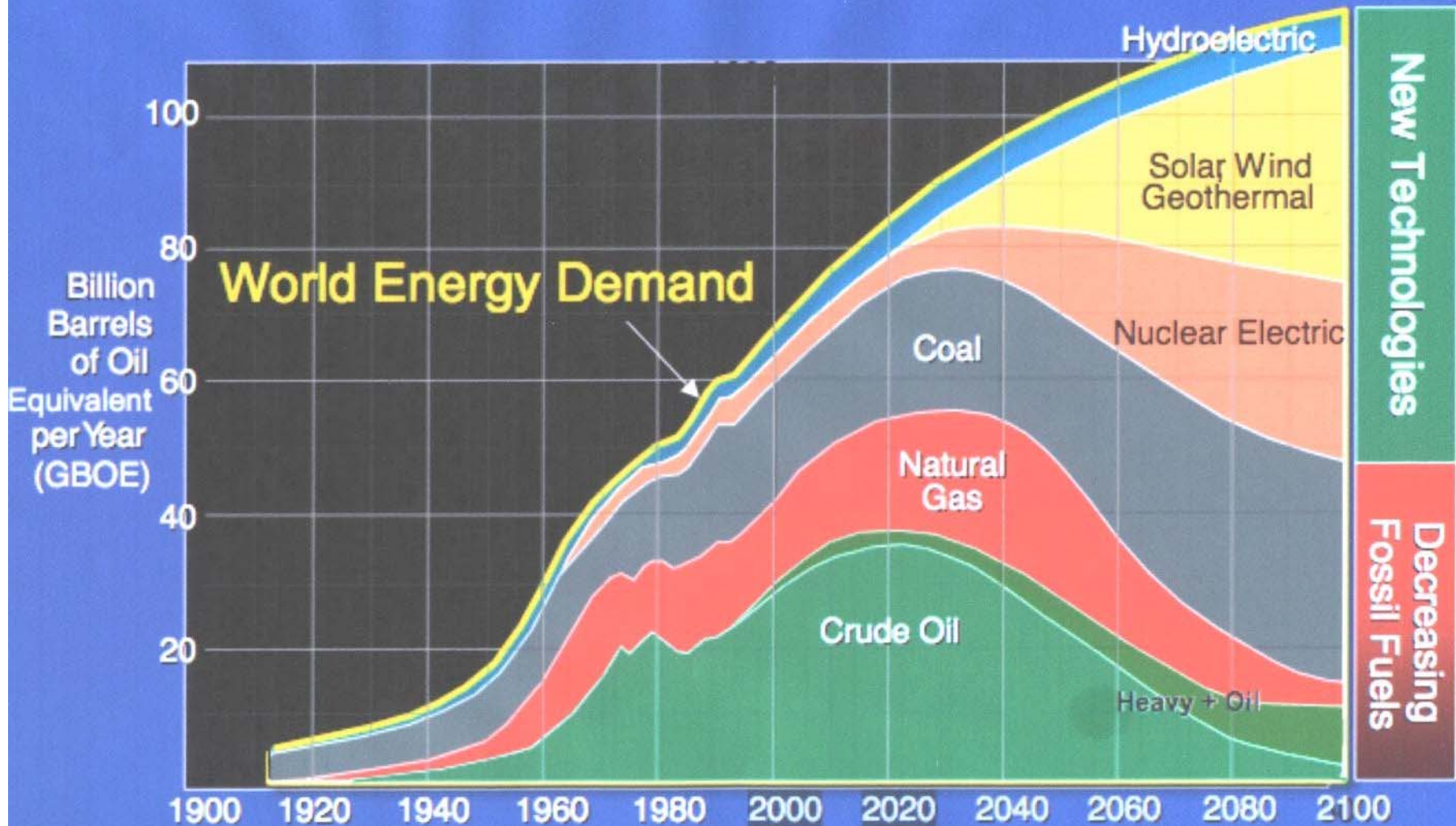
Objective

Convert Green Energy = Jobs

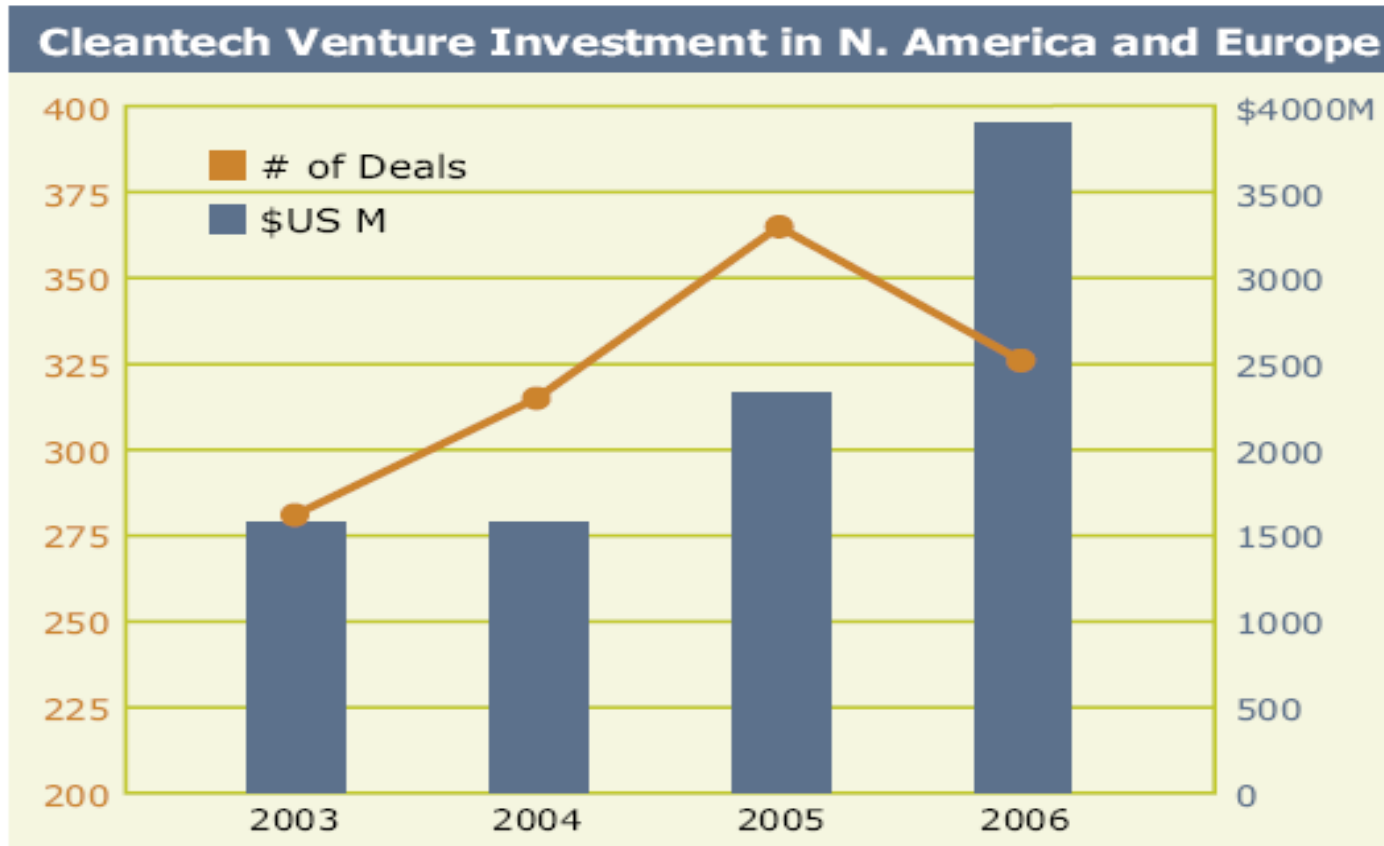
“Rule of Thumb” 1,000 Megawatt
Wind Green Energy Represents
about \$1 billion US capital
Investment, 3,000 manufacturing
jobs, 1,000 installation jobs



Projected World Energy Supplies



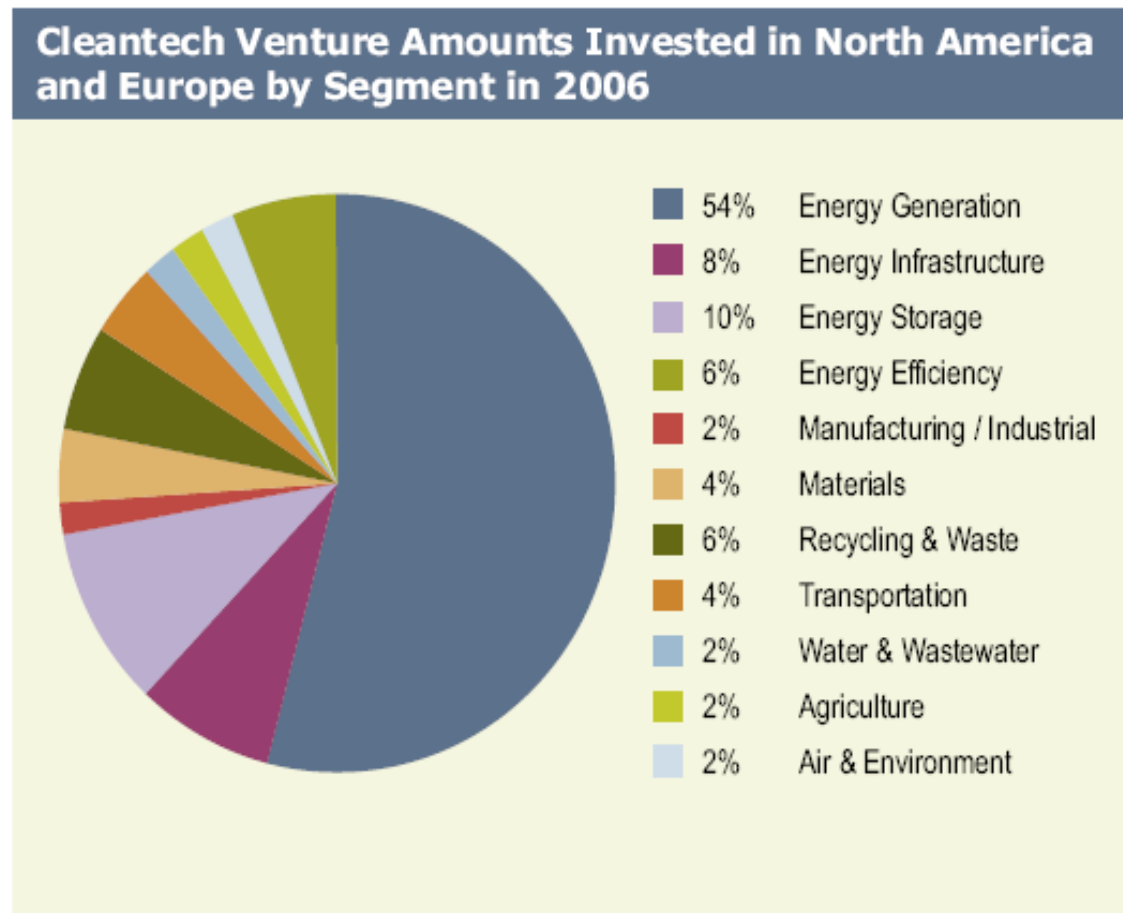
In 2007 CleanTech grew to 2nd or 3rd largest Venture Capital Sector with over \$55 billion in venture investment



Source: Cleantech Network™

Fig. 2.1: Cleantech venture investment in North America and Europe climbed from 2003 to 2006, with a significant boost between 2005 and 2006.

Energy Generation Leads Investments

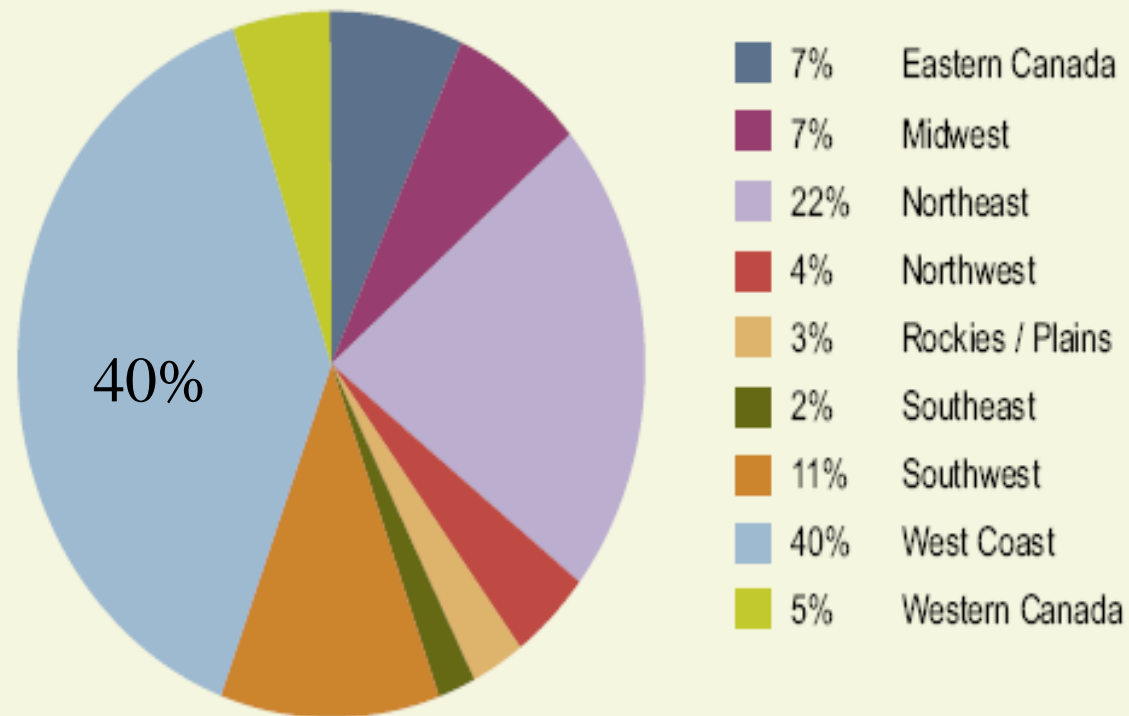


Source: Cleantech Network™

Fig. 3.2: Investors backed a variety of renewable energy companies in 2006, making the Energy Generation segment the largest.

West Coast Leads the Action

Percentage of Cleantech Venture Investment in North America by Region in 2006



* Total does not equal 100 due to rounding.



Solar Market Focus

Wind, Wave & Geothermal

- Oregon's competitive advantage
 - Silicon based industries
 - Proximity to California
 - Business environment
 - Incentives
- Wind: Significant Resource
- Geothermal Resource
- Wave: Significant Resource
- Bio-Fuels, Celluloic: Significant Resource

Eugene CleanTech Targets

- Photovoltaic (PV) manufacture
- Bio-fuels (Cellulosic)
- Wave & wind equipment manufacturing
- Design/engineering/software

Lane County Site Challenge

Date	Account	Year	Size
Genentech	Bio-Pharma	06	80 acres
SolarWorld	PV Man	06	100 plus
Apricus	PV Man	06/07	250 acres
Crystal	PolySilicon	06/07	100 plus
Schott solar	CSP/PV	07	100 plus
Evergreen	PV	07	75 acres
Navitas	PolySilicon	07	150 acres
NN2	ThinFilm Solar	07	150 acres
Tahoe	ThinFilm solar	07/08	150 acres
6NSilicon	PolySilicon	07/08	2 to 5 acres
Tower	CSP Farm	08	250 acres

Kettle Foods, Salem



Zero Net Energy Home, Portland



Pelamis Wave Power





Wind is Price Competitive

20% annual compounded growth rate



Nevada One Concentrated Solar Power .08 kWh

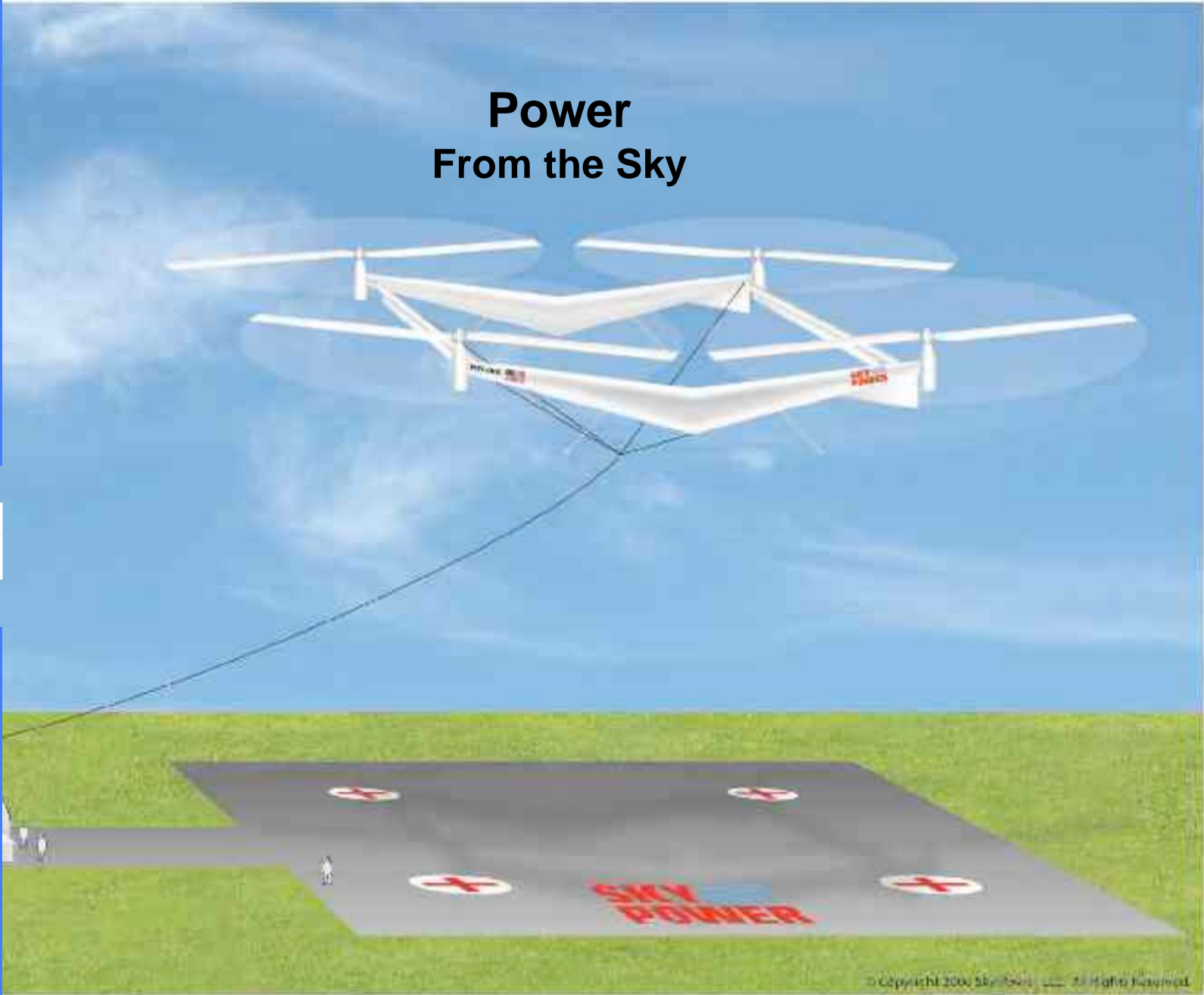


Solar Thermal Concentrated Solar Power



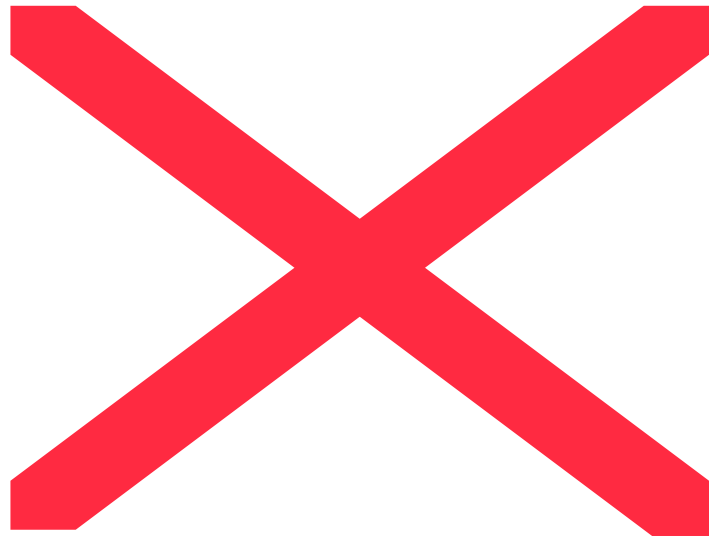
Power From the Sky

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High Altitude Flying Wind Generators (FWGs)



Solar Farms Over 200 Acre in Size



Geo-Thermal

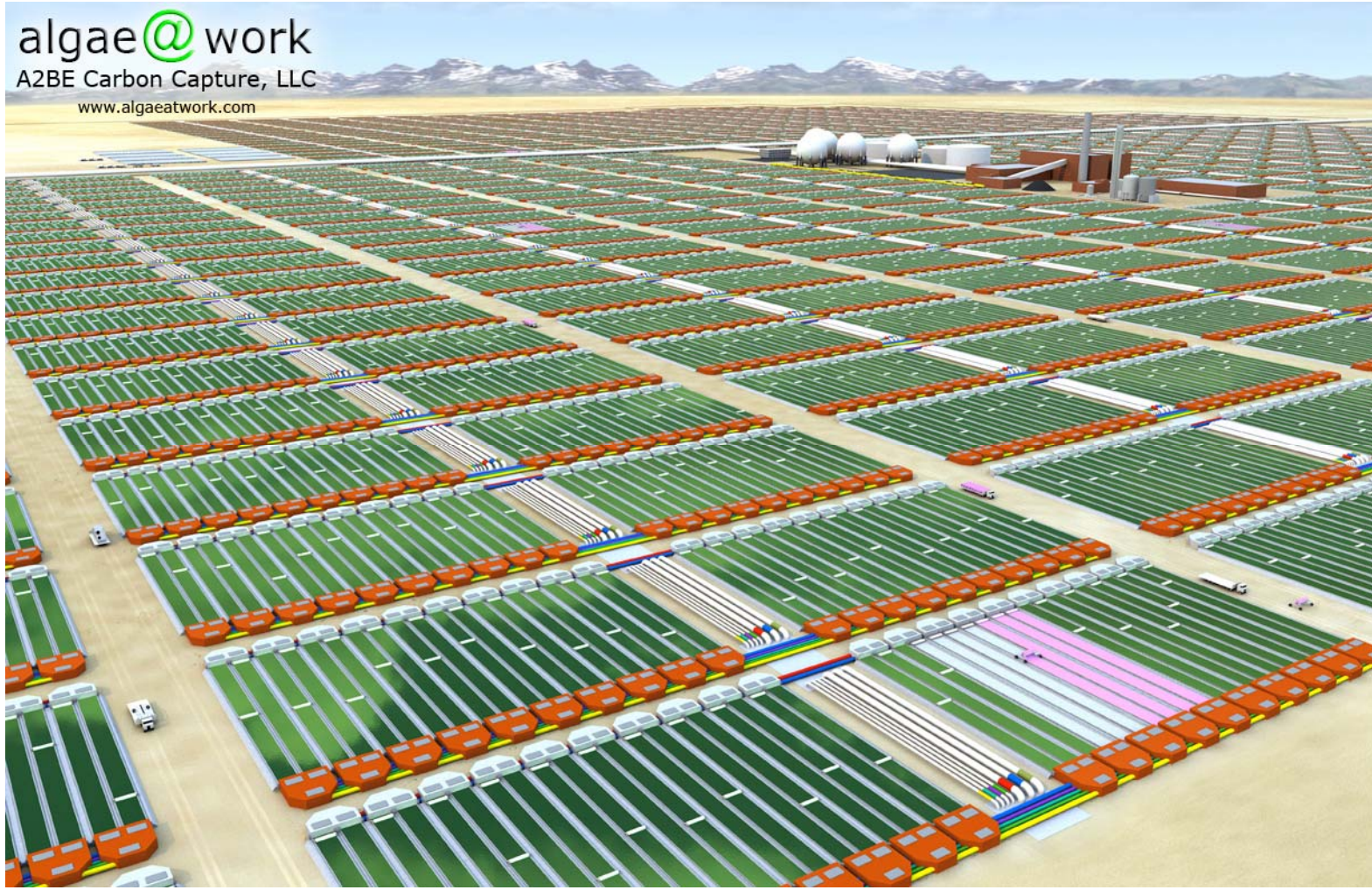


Carbon
Capture &
Recycle

Photosynthetic Industrialization

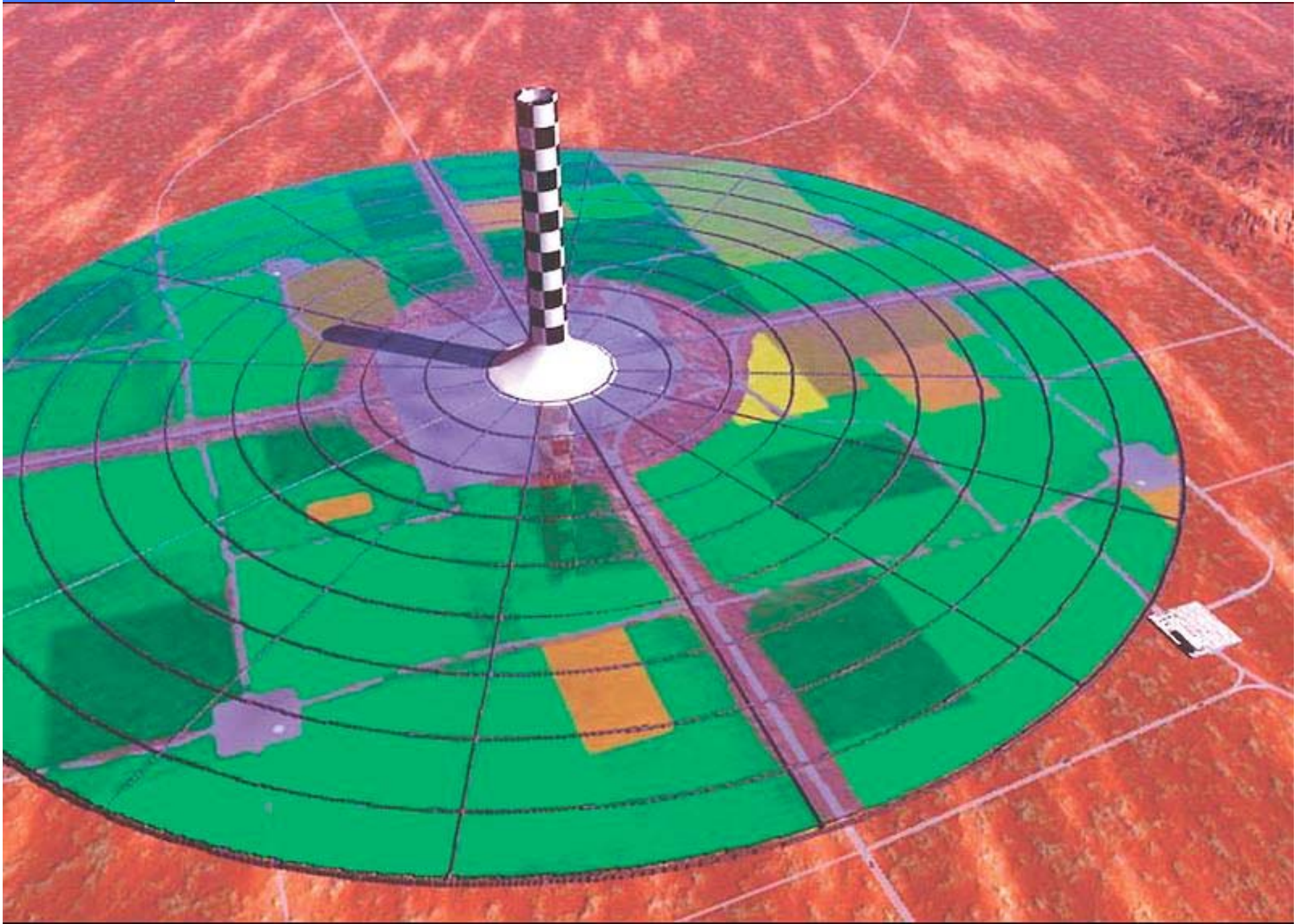
Harnessing the Power of Nature

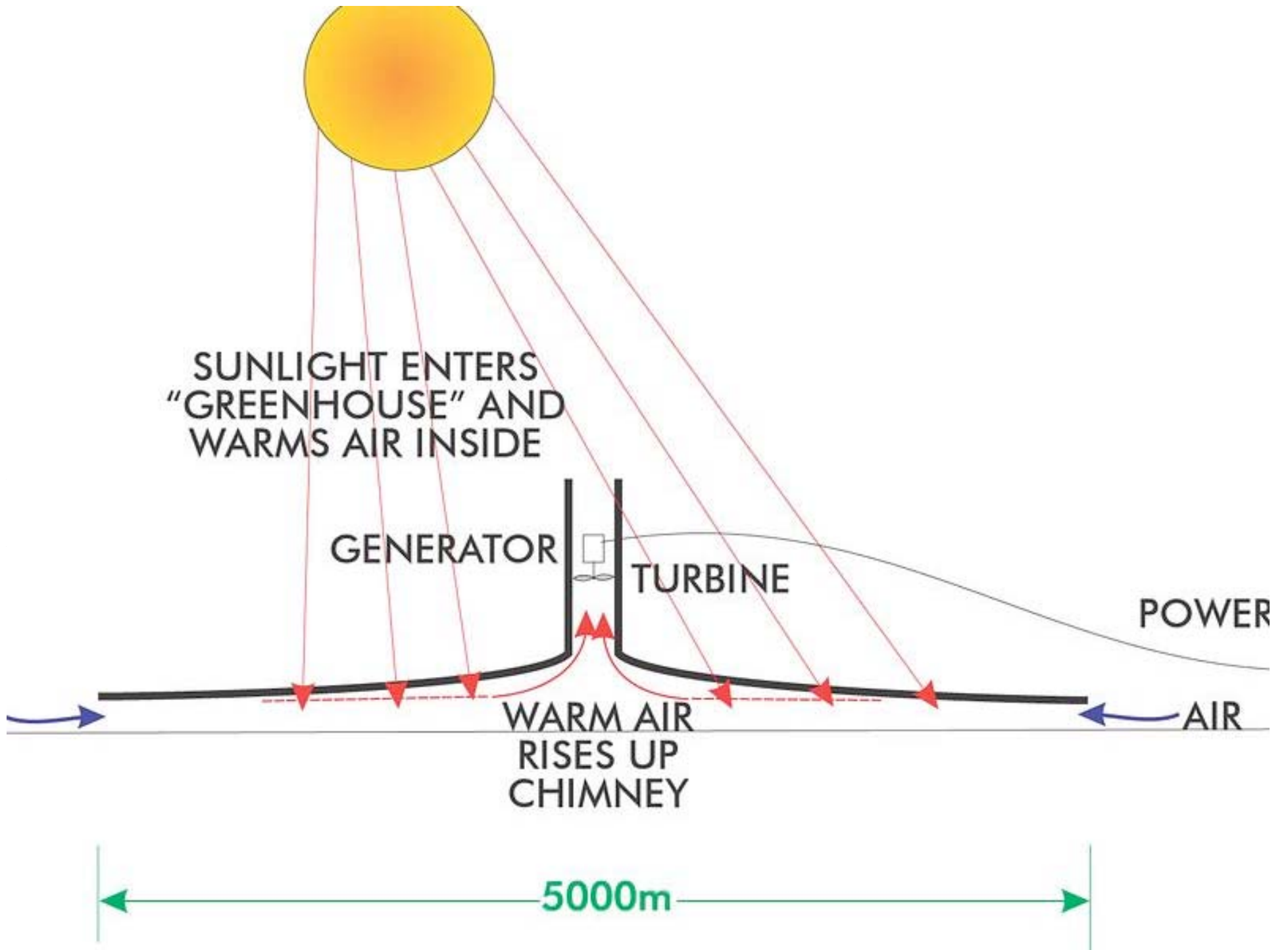
algae@work
A2BE Carbon Capture, LLC
www.algaeatwork.com



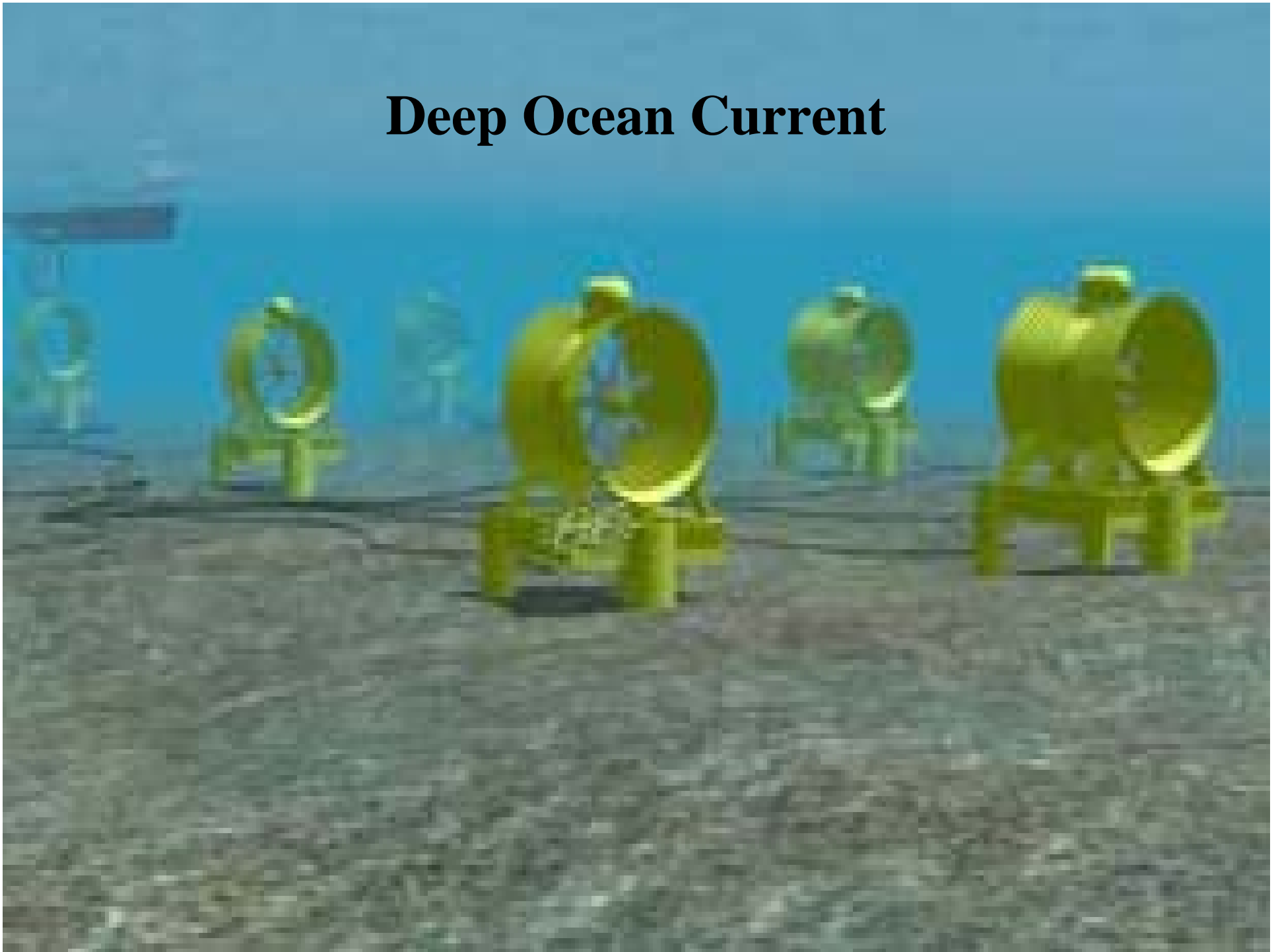
Bio-Fuel Plant







Deep Ocean Current





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