# Sun Belt Solar Farming

William C. Patterson, B.S. Met.E., M.B.A., Ph.D. 2017

## Solar Farming Vision

- Convert Huge Reserve of Dormant South West Desert Brush Acreage to Orderly Fields of Long-Lasting Solar Panels
- Unused Landscape Transforms to Productive, Attractive "Solar Farm"
- Wasted Sunshine Transforms to Electrical Energy as a Year-Round,
  Continuously-Harvested, Life-Saving Crop
- Solar Panels Shade the Platform Desert Soil, Limiting Evaporation and Desertification
- Cool Solar-Electric Conversion Relieves 15%-20% of Sun's Huge Thermal Burden from the Landscape

# Solar Farming Benefits

- Converting 5% of Arizona (or New Mexico) Land Area to Solar Farming Furnishes Enough Power to Supply the Entire U.S. Energy Grid
- Solar Farms Can Alleviate South West Water Shortage and Expanding Desertification
- Solar Farms Are a Once-Planted "Crop" with Low Maintenance Burden
- Solar Farms Can Co-Generate Agriculture, Yielding New Proximate Food for Sun Belt Residents
- Replication of "Cool" Solar Farming Around the World Will Help to Alleviate Global Warming, Reduce Pollution and Carbon Loading of the Atmosphere, Reverse Climate Damage, and Help Feed the Poor
- Solar Farming Stops "Oil Wars" and Terrorism, and Moderates Cost of Living
- Solar Farm Energy is the Cleanest, Safest, Quietest Energy Available

## Solar Farming Christian Initiative

- Since Solar Farming Originated as a Christian Initiative, Christian Men and Families Ideally Become the First Solar Farmers
- Emergent Solar Farming Livelihood Can Help to Restore Family Life and Values, Reviving a God-Given Institution That Suffered Greatly During Years of Energy Shortage
- Composing Solar Farming Under Christian Stewardship Restores Peace, Goodwill, and Reliability to National and International Energy Policy
- Once-Planted Solar Farms Afford Easy Living, Fulfilling God's Promise of "Heaven on Earth" (Deuteronomy: 11.21, Psalms:89.29) and "Entering Into his Rest" (Hebrews:4.9-110)

# Solar Farm Technology

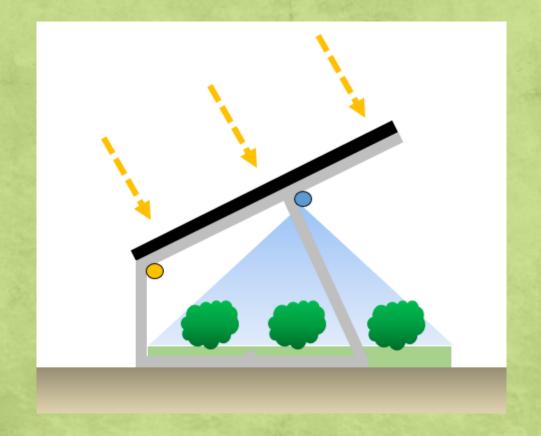
- Anchor ("Plant") Solar Panels Row-Wise in Ground, with Solid-State Collector Facing Heavenward at Sun Angle of 33 Degrees
- Collector Efficiency = 15% to 20%
- Sun-Follower Technology Can Improve Efficiency
- One Acre Static Solar Farm Can Generate 1.3 Million KWH Annually

## Solar Farm Augmented Collector Unit

- Corrosion-Resisting Welded Aluminum Structurals Anchor the Power Generation Unit to the Ground
- Hidden Electrical Interconnect
- Panels Set High Enough for Wind Passage & Easy Cleaning
- Solar Panel Shade Curtails Evaporation & Desertification
- Desert Food Garden Opportunity
- Situate Low-Standing Food Garden in Shaded Zone
- Run Automated Water & Feed Line Parallel to Electrical Conduit

# Solar Farm Augmented Collector Unit

Durable, Low-Cost, Simple, Easy Fabrication, Replicable

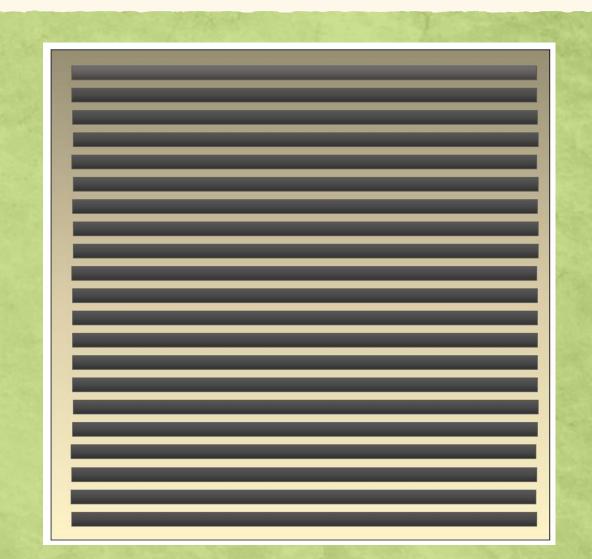


# Family Micro Farm

- 41m x 41m = 1,681 Square Meters or 0.4 Acres of Land Area
- 21 Rows of Solar Panels @ 33 Degrees Sun Angle
- 835 Square Meters or 0.2 Acres of Solar Panel Area
- Micro Energy Farm Generates 123,830 W or 542 MWH/Year

## Micro Energy Farm Overhead View

- 21 Permanent Rows of Solar Panels
  - Like Annual Rows of Corn
- 41 Meters x 41 Meters Property Dimension
- 1,681 Square Meters (o.4 A) of Land Area
- 835 Square Meters (o.2A) of Solar Panels
- 542 MWH/Year to Home and Energy Grid
- After 6.5 Years Solar Farm Generates \$95,000
  Annual Family Income (\$238,000/Acre)
- An Average U.S. Farmer Receives Annual Harvest Income of Only \$250/Acre

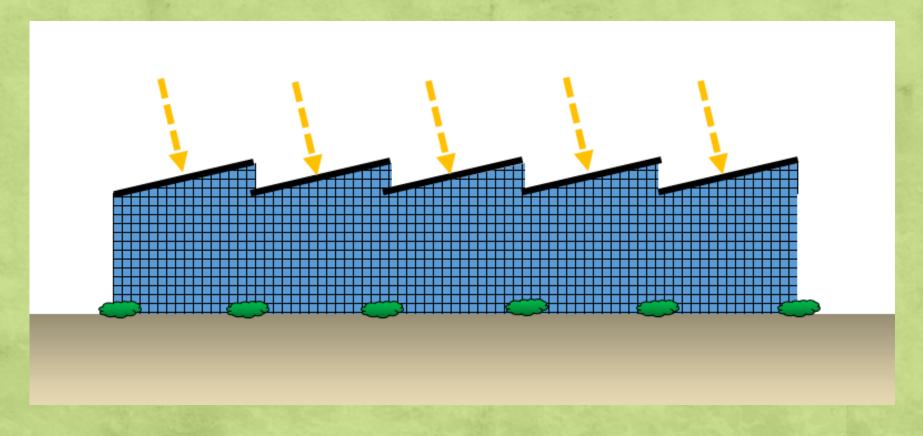


#### Sun Belt Green House Solar Power Station

- Perpetual Electrical Energy + Food Energy
- 1 or 2 Stories High
- Automated Water & Feed
- Green House Nullifies Evaporation
- Converts Desert to Food Garden
- Roof-Top Solar Panels Feed State & Nation Electrical Grid
- Beautiful Sun Belt "Garden City"

#### Sun Belt Green House Solar Power Station

- Green House Profile View
- Glass Facade Similar to Easy-Clean Glass-Wall Office Building



#### Solar Farm Investment Model

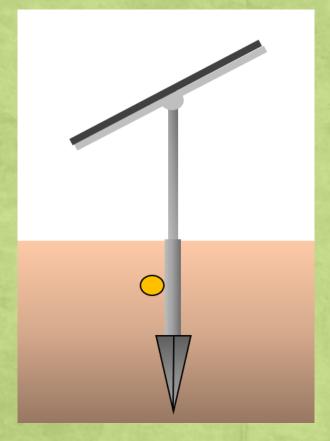
- Initial Investment by Solar Farmer \$1,000
- Solar Panel Life: 20 to 40 Years
- Micro Farm Less Than 0.5 Acres of Tax-Free Land
  - o.4 Field Acres
  - o.2 Solar Panel Acres
  - Alternate Use Value of Desert = \$0
- 35% Government + Industry + Church Subsidy
- Total Reinvestment of Energy Savings and Utility Buy-Back Profits
- Solar Farm Project Payback 6.5 Years
- Solar Farm Family Income \$95,000/Year After 6.5 Years

#### In-Ground Sun-Follower Solar Power Unit

- Single Metal Post Anchors Solar Panel in Earth or Concrete
- Solar Panel Retracts Flush to Earth in Heavy Wind, Severe Storms, or Over Night
- Servo Mechanism Optimizes Panel Angle and Sun Tracking
- Free Solar-Electric Energy Powers Post Retraction & Elevation, Panel Angle Optimization, and Sun Tracking
- Underground Cable Connects All Sun-Follower Units and Conducts Solar Electricity to Base Station

## In-Ground Sun-Follower Solar Power Unit

Deployed Position



### In-Ground Sun-Follower Solar Power Unit

- Retracted Position
  - High Winds
  - Severe Storms
  - Night
- Retraction & Extension by Solar Electric Power
- Underground Cable Connects All Sun-Follower Units and Conducts Captured Solar Electricity to Base Station for Re-Distribution

