Floating Solar Panels

Mark Rangel

03/03/2022

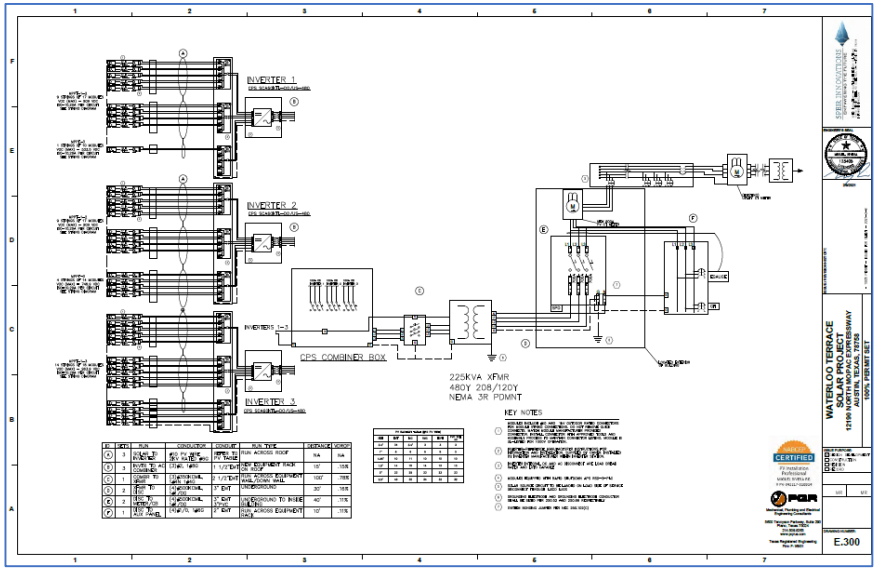
Solar Brief Overview

- Who Am I & What I Do
- How Solar Works
- Floating Solar Panels
- Solar PV Project
- Incentives
- Procurement Options
- Cash Flow Model
- Q&A

SPEIR C & I

Mark Rangel

- Austenite
- Mechanical Engineer
- 18 years in Solar
- Speir
  - Developer
  - Engineering
  - Procurement
  - Construction
- Business Development
  - Off taker Cash Flow Models
  - Project Proformas
  - Financing Products
  - Land Procurement/Entitlement
  - Interconnection
  - Secure Incentives/Grants
- PRECON
  - Concept design
  - PV Production models
  - Estimating
- M&V/P&G



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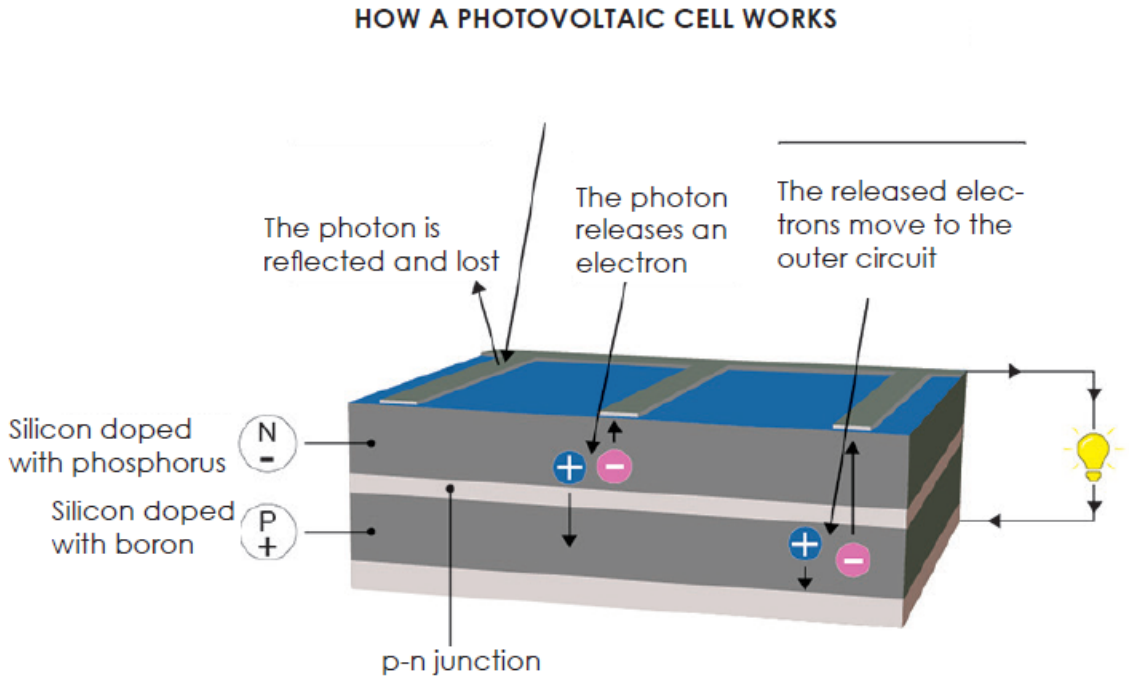
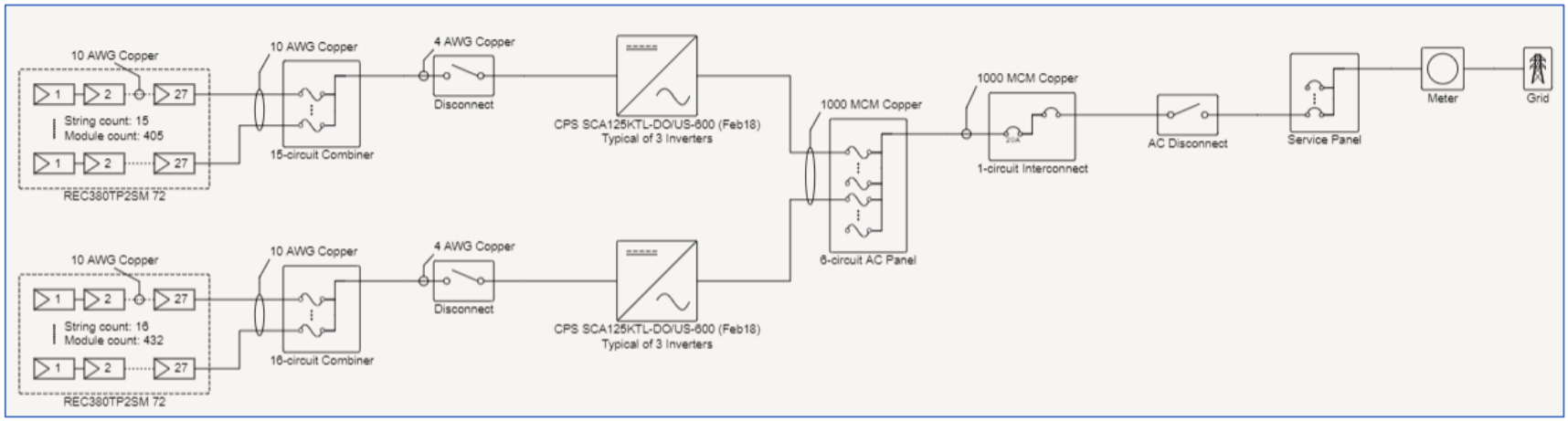
How Solar Works





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Products

Solar Panels or PV Modules

450-550W
1000-1500V
Monocrystalline & Bifacial
93.86×43.15×1.38 inches 25 SQFT
1kW = 75 Ft

Module Efficiency η m (%)	20.5

DC/AC Inverter

CPS SCA50KTL-DO/US-480
CPS SCA60KTL-DO/US-480

60-200kW
Efficiency 98.8%

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Typical Warranties

- 5-year Speir C&I workmanship
- 10-year solar workmanship
- 25-year solar panel production
- 10-year workmanship inverter
- Speir offers an annual O&M service that provides:
  - Preventative maintenance
  - Annual measurement & verification reports
  - Performance guarantee

Rooftop Mounting Applications

Ground Mount Mounting Applications

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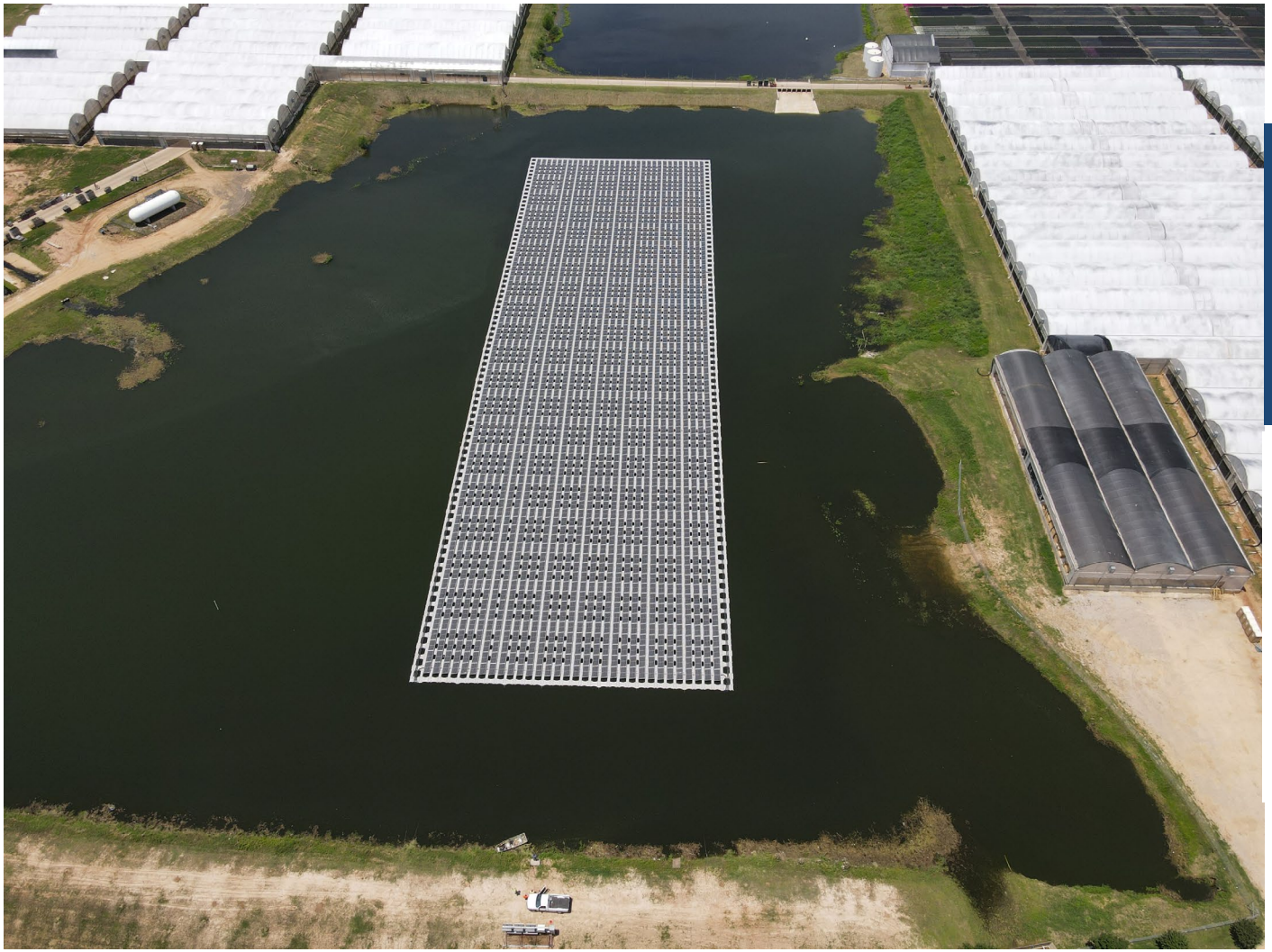
FPV Mounting Applications



Ciel & Terre

Hydrelio® Classic
The standard version

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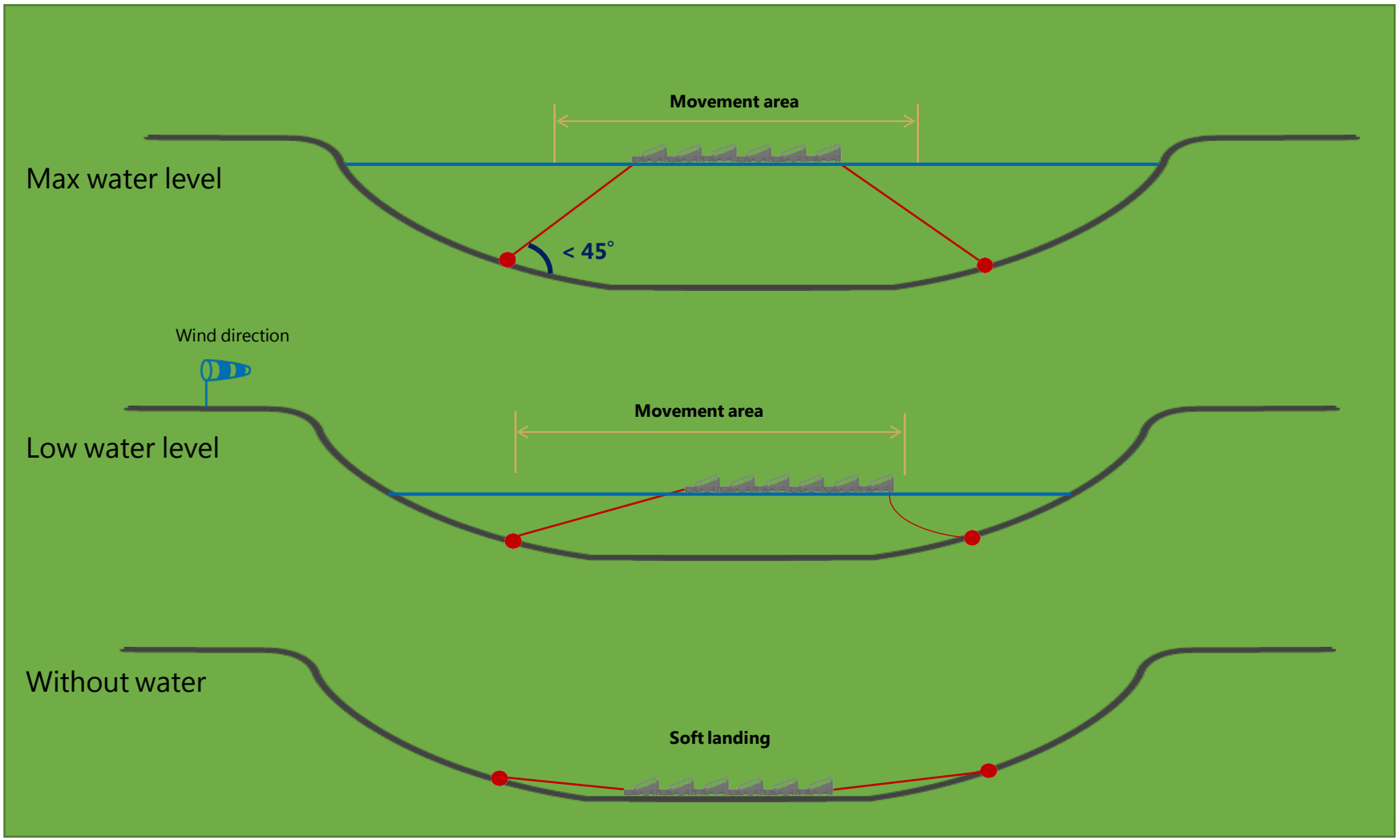
A DESIGN ADAPTED TO WATER LEVEL VARIATION



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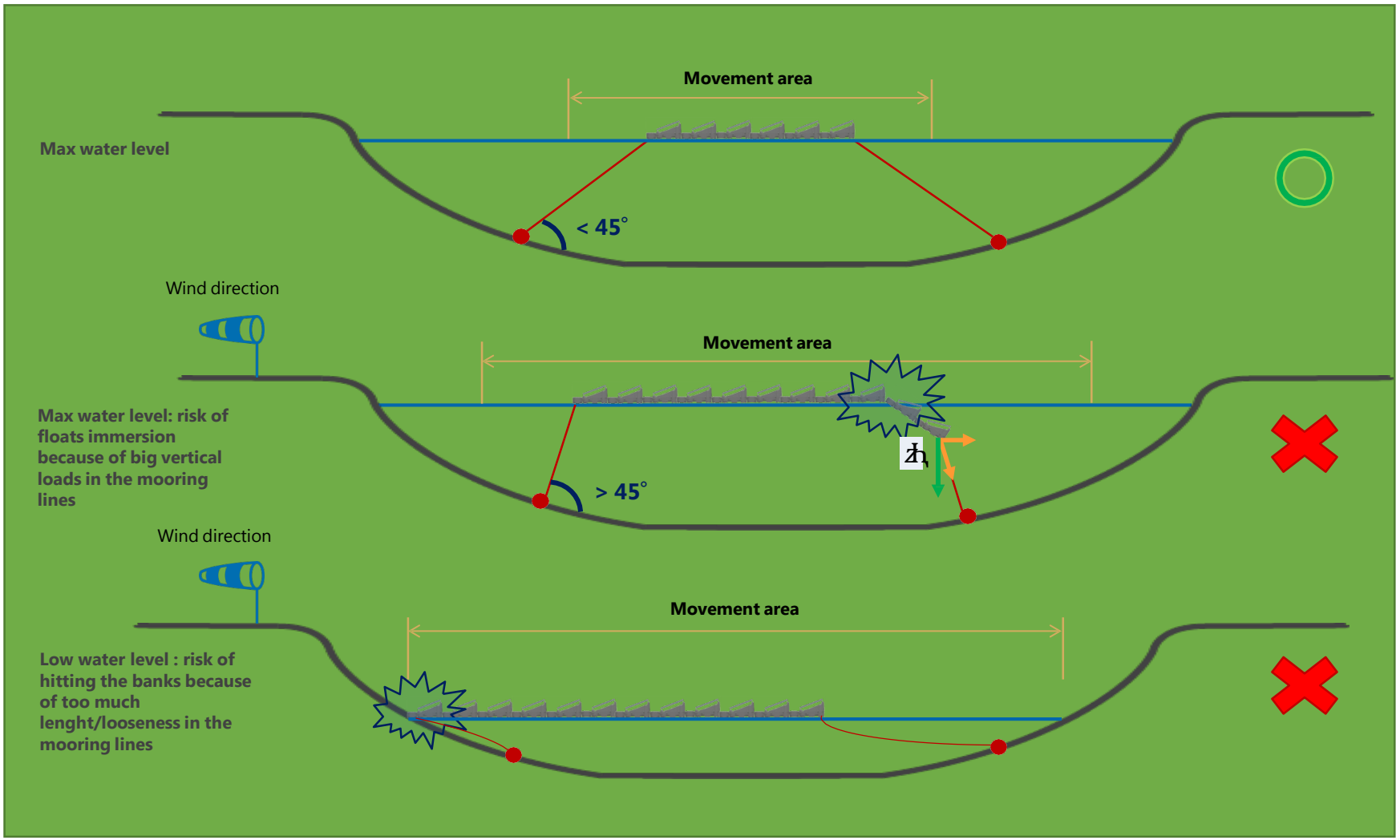
ANCHORING CABLES: MAX 45° WITH THE POND BOTTOM



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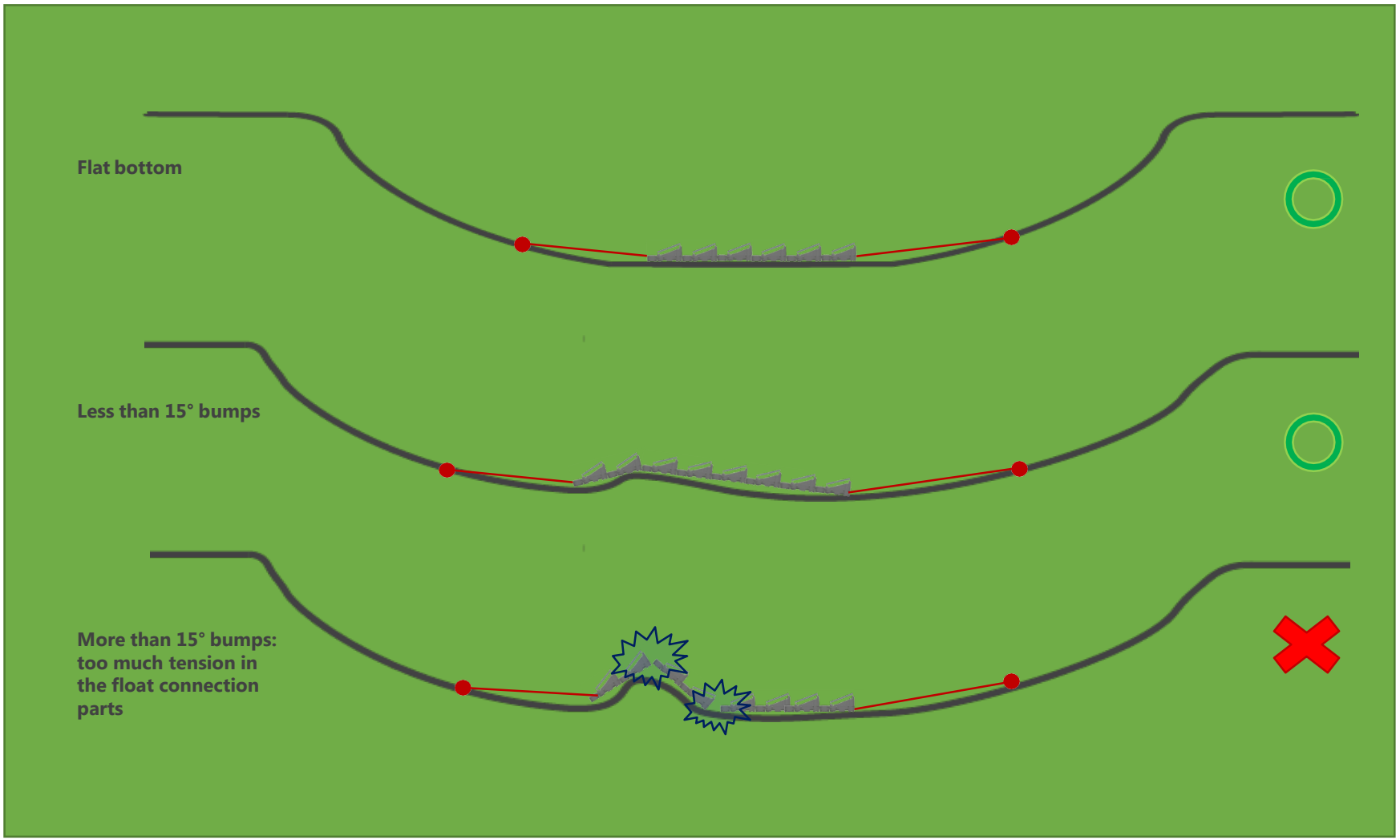
CONDITIONS FOR A SAFE SOFT-LANDING



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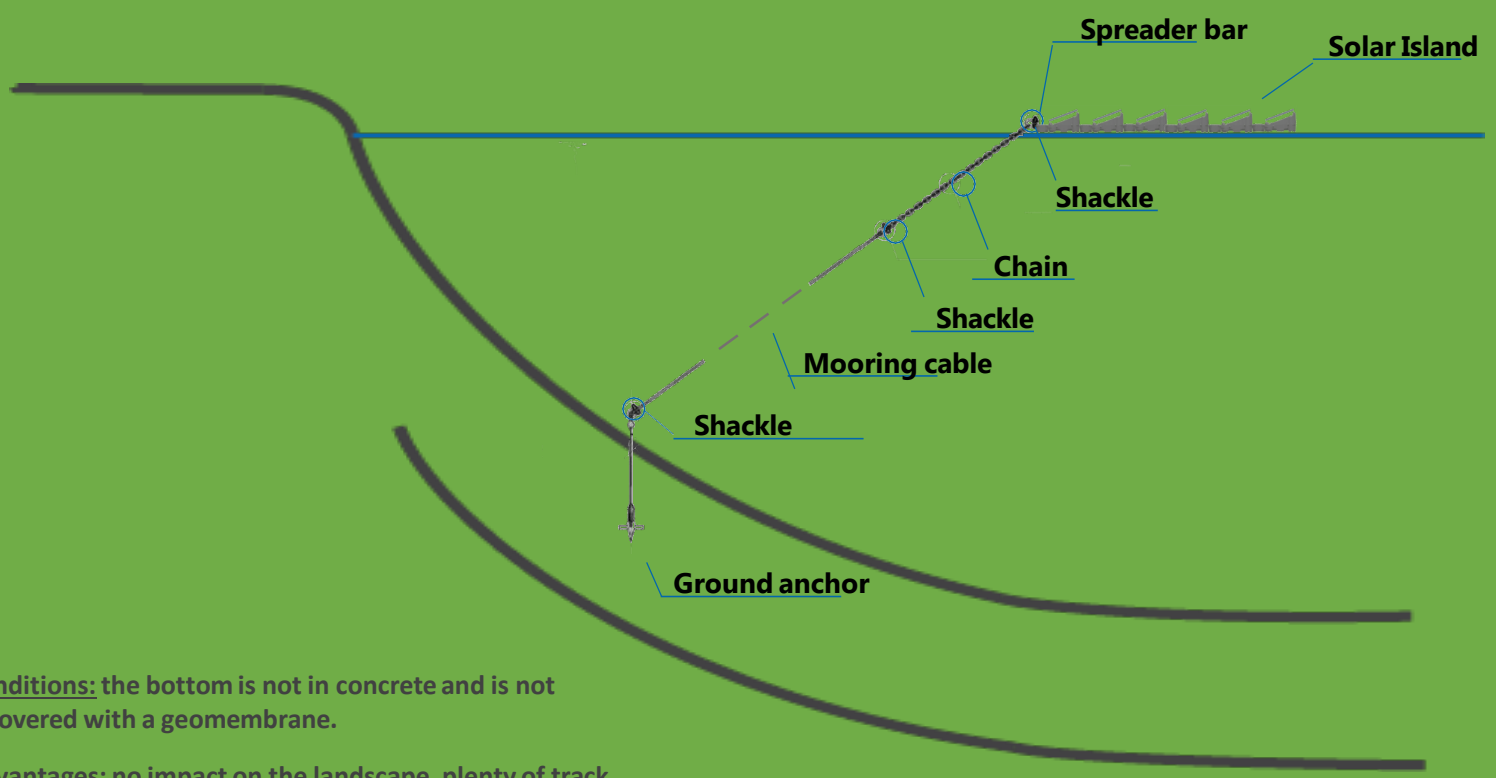
ANCHORING METHOD: GROUND ANCHORS ON THE BOTTOM



Conditions: the bottom is not in concrete and is not recovered with a geomembrane.

Advantages: no impact on the landscape, plenty of track records.

Disadvantages: need of divers for works and maintenance.

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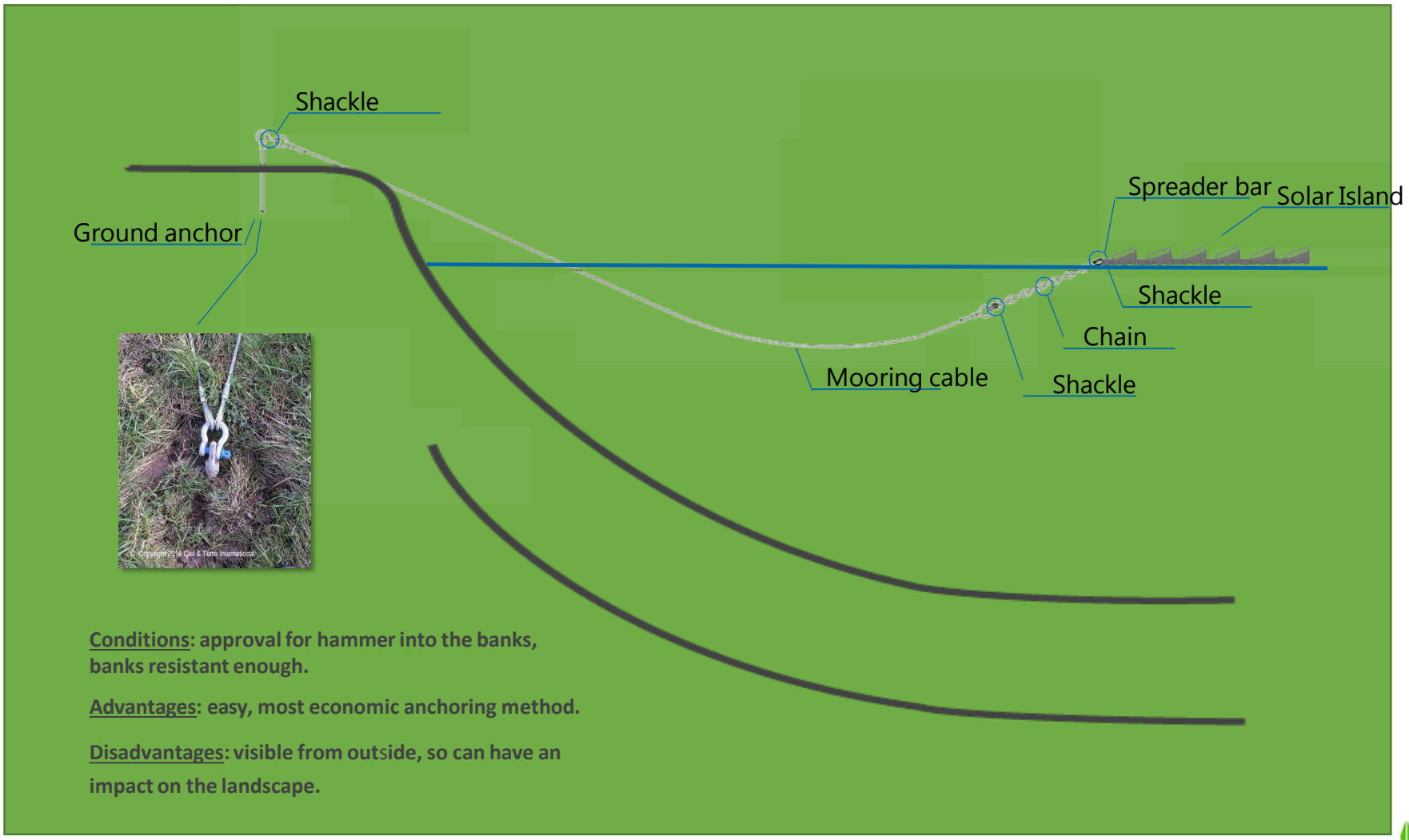
ANCHORING METHOD: GROUND ANCHORS ON THE BANKS



Conditions: approval for hammer into the banks, banks resistant enough.

Advantages: easy, most economic anchoring method.

Disadvantages: visible from outside, so can have an impact on the landscape.

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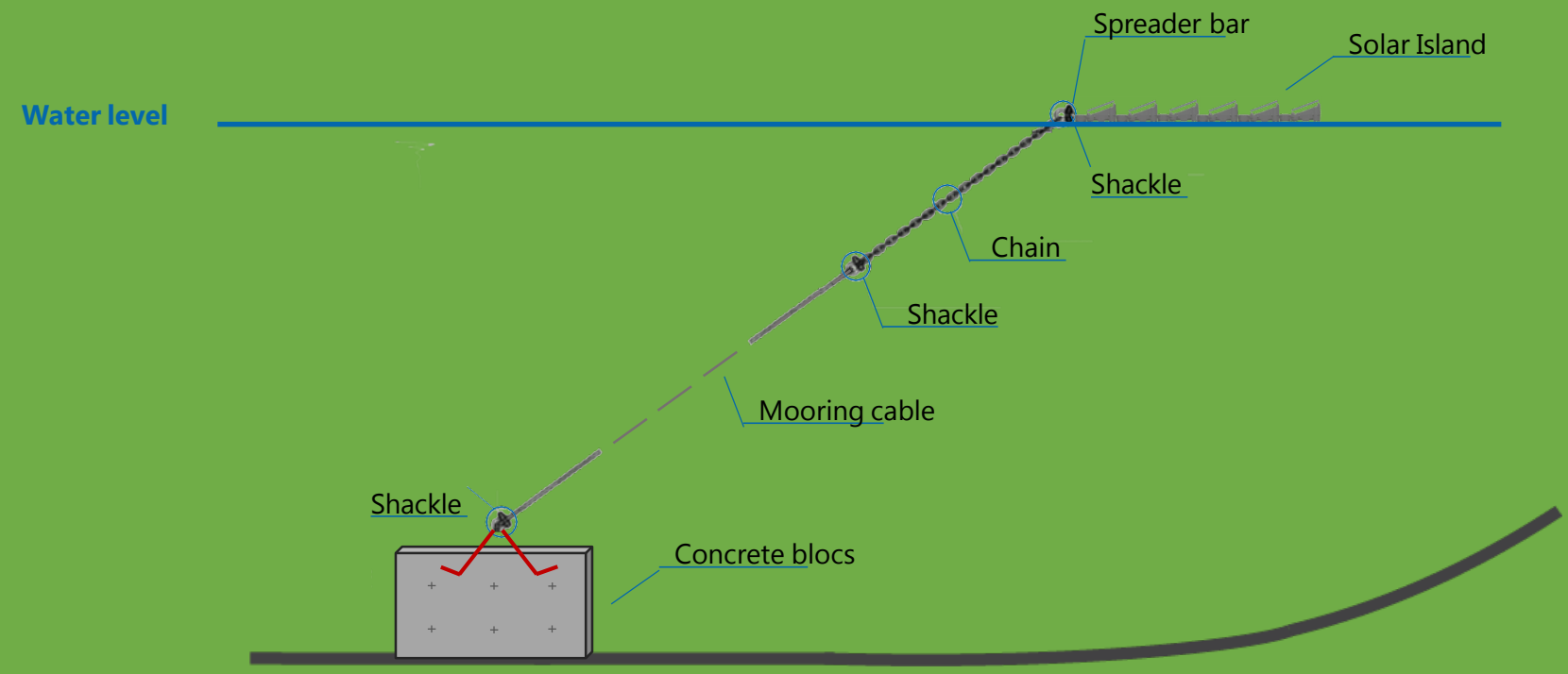
ANCHORING METHOD: CONCRETE BLOCKS ON THE BOTTOM



Conditions: need to have enough space to mold/set the concrete blocs.

Advantages: method used in case ground anchors cannot be installed.

Disadvantages: need heavy worktools like cranes.

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ENVIRONMENTAL BENEFITS

- Neutral or positive environmental impact, no danger to existing ecosystems
- Minimizes evaporation by covering water
- Improves water quality and reduces algal bloom thanks to the platform's shading
- Limits reservoir erosion by reducing wave action

SOCIAL BENEFITS

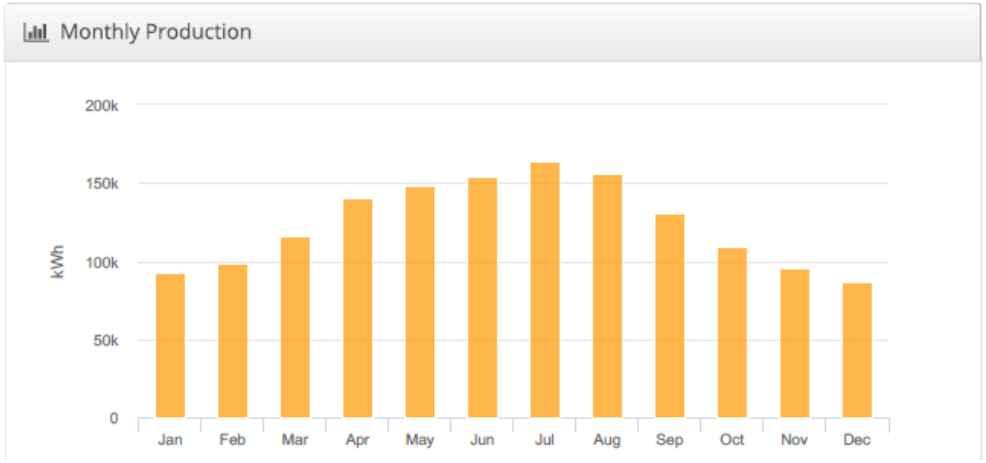
- Preserves valuable land and water for other uses
- Rehabilitates contaminated areas with clean energy
- Compatible with recreational activities
- Amenity, positive aesthetics

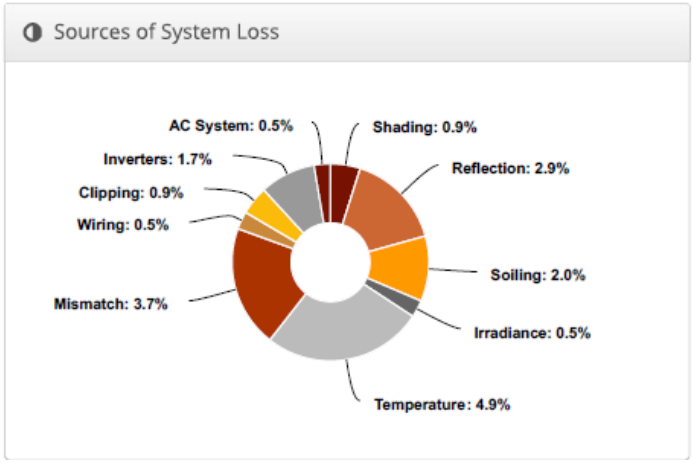
ECONOMIC BENEFITS

- Converts unused spaces into profitable areas
- Reduces grid-connection costs and major infrastructures investments
- Smoothest & fastest development processes
- Enhances electricity generation thanks to water's natural cooling effect

Solar PV System Specs.

Solar Photovoltaic (PV) Distributed Generation (DG) System	
Application	**Floating PV**
System Size (kW DC)	**985**
System Size (kW AC)	**750**
Solar PV Panel	**REC 380W**
Solar PV Panel Quantity	**2,592**
Solar Inverter	**Chint 125kW**
Solar Inverter Quantity	**6**
1st Year Solar PV Energy Production (kWh/yr)	**1,495,780**
Array Area (SQFT/Acre)	**64,800/1.5**





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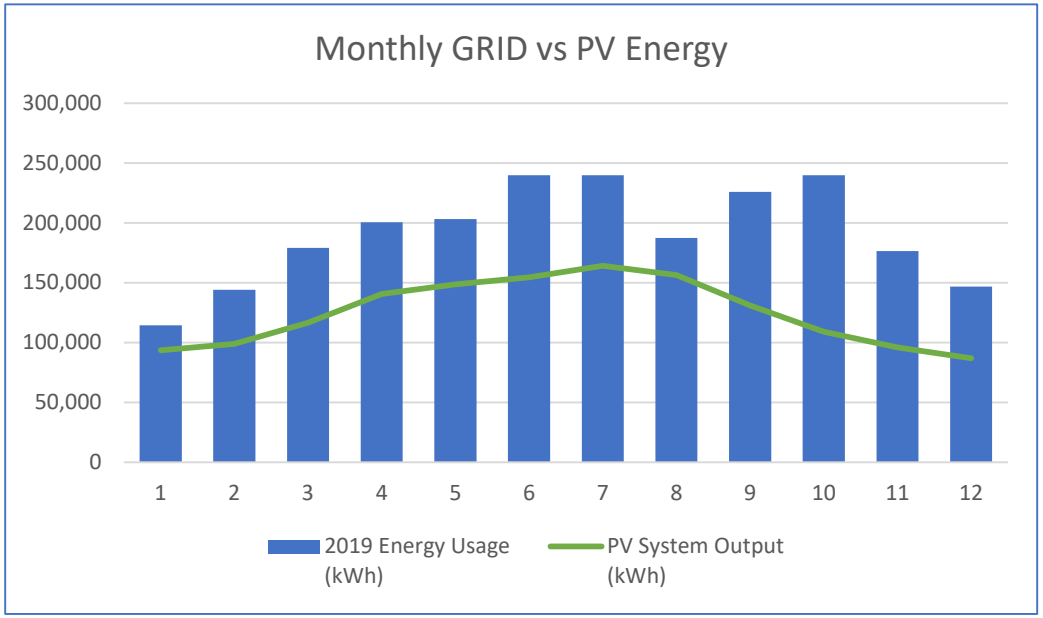
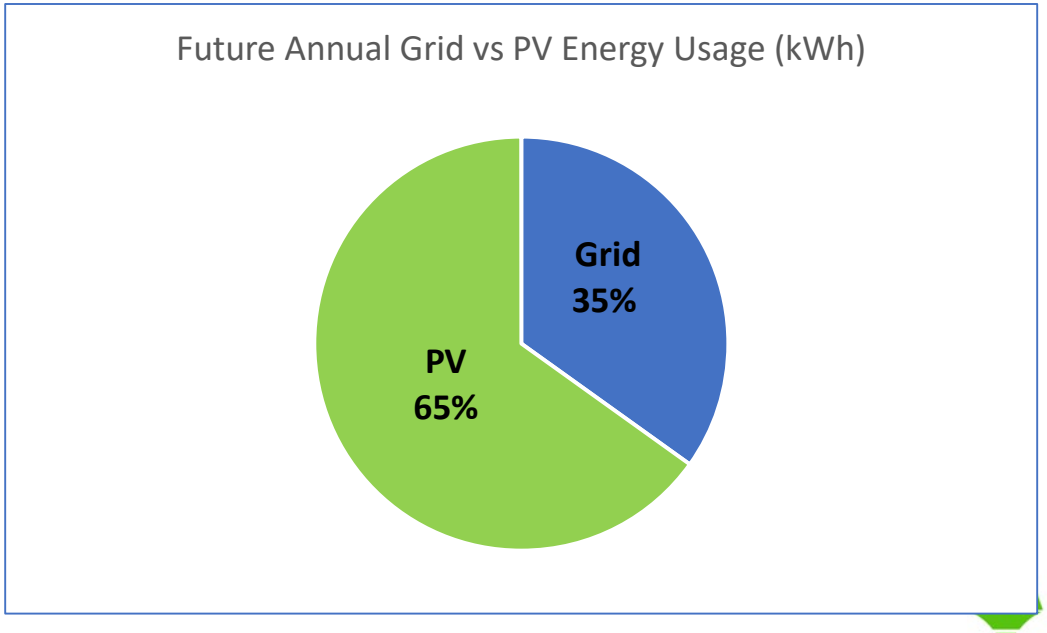
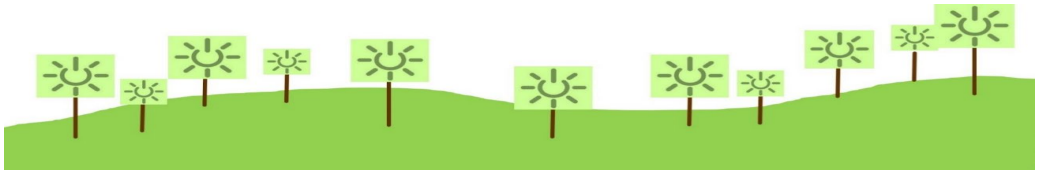
Energy Analysis





Environment Savings



1,088	Tons of Carbon Dioxide
2,176,269	Pounds of Carbon Dioxide
207	Cars Removed from Road
207	Miles Driven
112,179	Gallons of Gasoline
25,305	Trees Planted
809	Acres of Trees Planted
91	Homes Powered
22,083	Light Bulbs Powered

WHAT IS SUSTAINABILITY MARKETING?

Sustainability marketing, also known as renewable marketing, green marketing or green PR, is a type of marketing strategy that focuses on an organization's commitment to the environment by promoting its sustainability efforts. Developing the right green marketing strategy can have a huge impact on securing investors, cultivating loyal consumer relationships, hiring and retaining employees, and gaining a competitive edge.

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Federal Incentives

- Roughly 48% of the project cost is paid for by federal tax reduction programs. There are two tax benefits solar projects provide (under Section 48):

Name	Description
The Solar Federal Investment Tax Credit (ITC)	A dollar-for-dollar tax reduction that is worth 26% of the project cost. The ITC can be carried forward for 20 years.
The 100% Bonus Modified Accelerated Cost Recovery System (MACRS)	Also known as accelerated depreciation- allows you to write off the entire cost of the system in the first year of operation. This benefit covers another 22% of the project cost.

State of Texas

- 100% property tax exemption
- 10% State Franchise tax deduction

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USDA REAP Grant

- USDA REAP (Rural Energy for America Program Renewable Energy & Energy Efficiency) grant and guaranteed loan financing funding to agricultural producers and rural small businesses to purchase or install renewable energy systems or make energy efficiency improvements
- Grants for up to 25% of total eligible project costs
- Loan guarantees on loans up to 75% of total eligible project costs
- Combined grant and loan guarantee funding up to 75% of total eligible project costs
- Renewable Energy System Grants $500,000 maximum.
- Energy Efficiency Grants $250,000 maximum
- Agricultural producers with at least 50% of gross income coming from agricultural operations, and small businesses in eligible rural areas.
- Applicants must provide at least 75% of the project cost if applying for a grant only.
- Applicants must provide at least 25% of the project cost if applying for loan, or loan and grant combination.
- Project grants greater than $200,000 require a technical report.
- Energy efficiency projects require an energy audit or assessment
- Businesses must be in an area other than a city or town with a population of greater than 50,000 inhabitants and the urbanized area of that city or town. Check eligible business addresses.
- Agricultural producers may be in rural or non-rural areas
- Businesses must meet the SBA's small business size standards, which is determined by NAICS code. Check SBA's eligibility.

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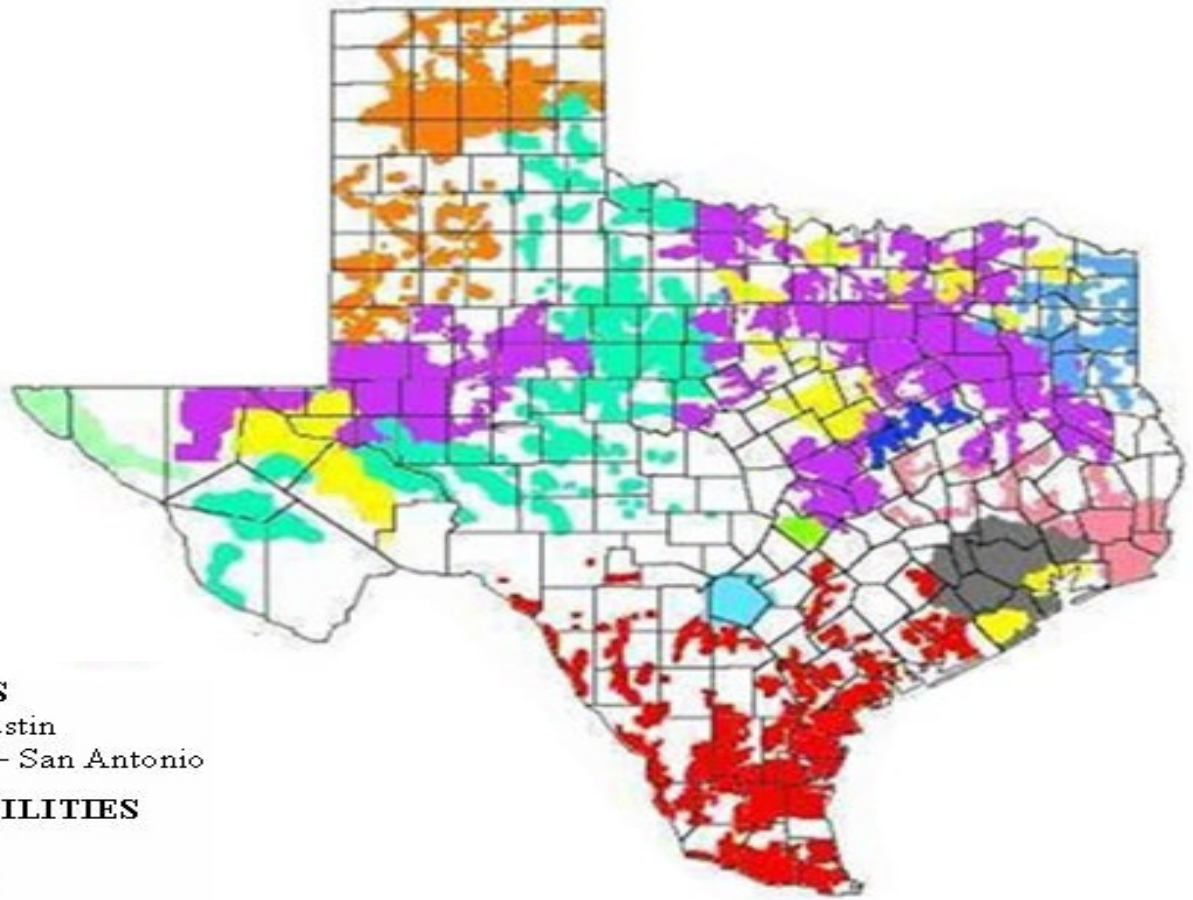
Local Incentives



MUNICIPAL UTILITIES
- Austin Energy – City of Austin
- City Public Service Board – San Antonio

INVESTOR-OWNED UTILITIES
- AEP Central
- El Paso Electric Company
- Entergy Texas
- Centerpoint
- Southwestern Electric Power Company
- TNMP
- Oncor Electric Delivery
- TXU SESCO
- AEP North
- Xcel Energy

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Local Incentives

- 100% property tax exemption
- 10% State Franchise tax deduction

Production Based Incentive (PBI)			
	Medium	Large	Extra-Large
Qualifying System Size (kW-AC)	< 400	400 – 999	999 <
Incentive Level ($/kWh)	0.09	0.07	0.05
Payment Term	5 Years		
Payment Method	Monthly On-Bill Credits		

Customer Type	VoS Rate ($/kWh)
(Solar capacity < 1,000 kW-ac)	$0.067
Solar capacity ≥ 1,000 kW-ac)	$0.047

- Oncor - $120,000 incentive up to 450 kW per ESID
- AEP - $56,250 for first 200 kW installed
- CPS – 50% of project cost up to $80,000

All must be installed by registered installer (that's us!)

Procurement Options

CASH PURCHASE: Own the System and the Energy

- Generally provides the highest Internal Rate of Return (IRR) and the quickest payback
- Ownership provides the greatest total energy cost savings over the life of a system
- Owner takes advantage of local and Federal incentives

Solar Loan: Borrow the Capital, Own the System, Use the Energy

- Like a bank loan or mortgage, but pay no upfront costs
- Customer owns and maintains the system
- Owner uses the financial benefits of solar (state and federal tax credits, local incentives, and avoided energy costs) to pay down cost of system
- Stay cash-flow positive through the life of the system

OPERATING LEASE: Lease the System, Use the Energy

- Third-party financier owns the system and takes advantage of the Federal tax savings while leasing the system to the property owner
- Property owner takes advantage of the local incentives/rebates
- Monthly lease payments to financier are reduced through energy savings
- At the end of the lease (~7-10 years) property owner can purchase the system at Fair Market Value (FMV), which is estimated to be 20% of the original system cost, renew the lease, or return the system to the bank

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More Procurement Options

PACE Loan

- Property Assessed Clean Energy (TX-PACE) is a proven financial tool that incentivizes Texas' property owners to upgrade facility infrastructure with little or no capital outlay.
- Long term loans (10-25 years) at 6-7% interest rates
- PACE financing may be used to pay for permanent improvements to the property that are intended to decrease water or energy consumption or demand.
- Owners choose a private sector capital provider and voluntarily request that the local government place a senior lien on the property for the total cost of the project. The owner commits to the local government that he/she will pay the TX-PACE assessment installments.
- TX-PACE is not a personal or business loan. It is a voluntary land-secured assessment that is paid off over time.
- The energy and/or water savings are structured to exceed the cost of the assessment, resulting in projects that are cash flow positive. As the assessment is tied to the property, the repayment obligation transfers to the next owner if the property is sold.

Power Purchase Agreement: Buy the Energy

- Third-party financier owns and maintains the system on your property
- Power produced is fed back into the customer's electrical service to offset the utility bills
- Rate is pre-negotiated, so you know how much you will be paying over the lifetime of the agreement (~15-25 years)
- At the end of contract, agreement can be extended, system can be removed, or system can be purchased by property owner

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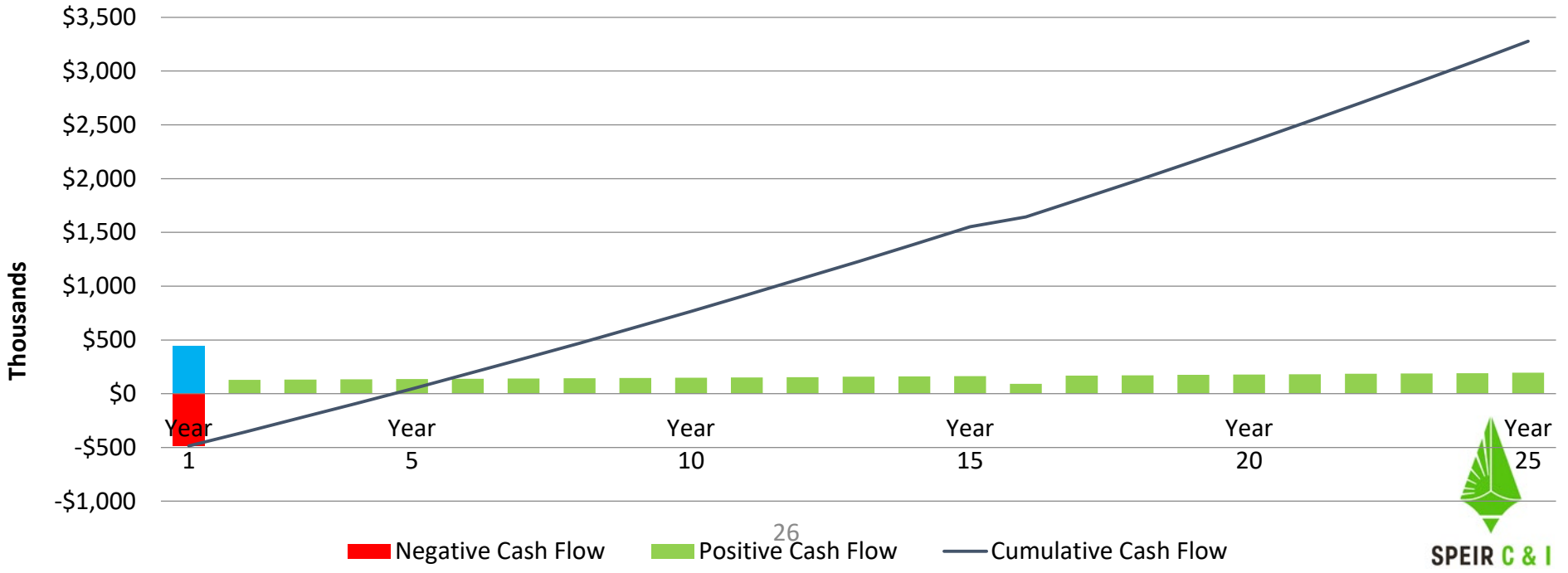
Bottom Line

Financial Key Points	
Turn-key Contract Price	**($1,782,654)**
Price Per Unit ($/WDC)	**$1.81**
Average Annual O&M Cost ($/Yr)	**($7,789.16)**
Average Annual Energy Savings	**$164,654.41**
USDA REAP Grant	**$445,663.92**
Federal Investment Tax Credit	**$463,490.16**
MACRS Accelerated Depreciation	**$341,200.06**
First Year Out of Pocket	**($486,927.96)**

Cash Purchase	
Total Savings on Electric Bill	**$4,116,360.29**
25 Year NPV	**$2,045,526**
25 Year IRR	**28%**
Simple Payback (years)	**4.7**
Effective Cost Of Electricity ($/kWh)	**$0.021**



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Q&A

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Thank you.

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