

MISSION

CLEARWORLD, LLC, IS AN ALTERNATIVE ENERGY SYSTEMS SOLUTION PROVIDER WHOSE PRIMARY FUNCTION IS TO DESIGN AND TO RETROFIT ENERGY-EFFICIENT SYSTEMS THAT REDUCE UTILITY OPERATING AND MAINTENANCE COSTS IN PURSUIT OF GRID INDEPENDENCE.



RETROFLEX SOLAR LED TECHNOLOGY

- CLEARWORLD'S RETROFLEX IS A RETROFIT LIGHTING SOLUTION ORIGINALLY DESIGNED TO HARNESS SOLAR ENERGY AND PROVIDE EFFICIENT OUTDOOR LIGHTING. THE PATENTED RETROFIT DESIGN VERTICALLY WRAPS THE COMPLETE RETROFLEX SYSTEM TO POLES OF ANY DIMENSION, DIAMETER AND FINISH.
- ADDITIONALLY, RETROFLEX IS CURRENTLY BEING DEVELOPED AS STAND-ALONE SOLAR DISTRIBUTED GENERATION SYSTEM AS WELL AS THE CENTRALIZED RESILIENT POWER SOURCE AND COMMUNICATION NODE FOR SMART GRID INFRASTRUCTURE.
- RETROFLEX IS FOCUSED ON PROVIDING SOLAR LIGHTING SOLUTIONS FOR:



MUNICIPALS



**ENGINEERING
& DESIGN**



**PRIVATE
DEVELOPERS**



**FEDERAL
CONTRACTS**



RETROFLEX SOLAR LED TECHNOLOGY

PATENTED RETROFIT WITH INTEGRATED COMPONENTS

Parking Lot Light



Flood Light



Street Light



External Components

- 1 LED Street Light
 - 2 Patented Universal Array
 - 3 Flexible Solar Panels
- ## Internal Components
- 4 Lithium Ion Battery Pack
 - 5 Intelligent Charge Controller
 - 6 Power Inverter (On-grid)
 - 7 Lighting Controls & Wiring



RETROFLEX SOLAR LED TECHNOLOGY APPLICATIONS

OFF GRID: NEW INSTALLATIONS..... AVAILABLE

- MINIMAL INSTALL REQUIREMENTS
- ELIMINATE TRENCHING AND CALING
- REDUCE CAPITAL AND RECURRING COSTS
- REMOTE POWER SUPPLY FOR URBAN AND RURAL AREA DEVELOPMENTS

OFF GRID: RETROFIT INSTALLATIONS..... AVAILABLE

- RETROFIT EXISTING POLES
- REDUCE RECURRING COSTS
- INCREASED RELIABILITY AND SAFETY DURING ADVERSE WEATHER CONDITIONS
- SYSTEMS COMBINE RENEWABLE ENERGY AND ENERGY EFFICIENCY

ON GRID: LIGHTING AND GENERATION..... AVAILABLE

- OPTIMIZE SOLAR GENERATION WITH ROBUST ENERGY STORAGE
- MANAGE TIME OF DAY LOAD SWINGS FOR LIGHTING LOADS
- MITIGATE LINE LOSSES THROUGH DISTRIBUTED POWER ON POLES

SMART CITY: FOUNDATION OF POWER..... AVAILABLE

- CUSTOMIZABLE POWER SUPPLY FOR MOST DEVICES AND SENSORS
- RETROFIT IS EASY INSTALLATION AND FULLY SCALABLE
- HIGH LINE OF SIGHT ON POLE
- RUGGED EXTERIOR PROTECTS COMPONENTS



RETROFLEX SOLAR LED TECHNOLOGY

EXAMPLE: NEW INSTALLATIONS

Customer Profile

- The customer needs to install 100 streetlights in an existing neighborhood to replace old poles and rerun conduit.

Customer has two options...

Details	Traditional Solution	ClearWorld's RetroFlex
Infrastructure	Trenching, conduit, wiring, metering	None
Installation	Concrete footings	Concrete footings
Pole & Light Fixture	Customer supplied	ClearWorld supplied
Energy & Maintenance Costs	Recurring annual costs	None

CUSTOMER COMMITMENT – We establish relationships that foster a better tomorrow
for our customers and business partners

LEADERSHIP - Be transparent, innovated and courageous by challenging the status quo

ERROR PROOFING – Everything we do has to be at the highest of standards to meet our
customers' expectations

ACCOUNTABILITY – Stake and ownership of one another with integrity and fiscal responsibility

RESILIENCE – To never give up or give in to the challenge of today



RETROFLEX SOLAR LED TECHNOLOGY

EXAMPLE: RETROFIT INSTALLATIONS

Target Economics for Successful Retrofits

Customer's Existing Lights

If Average Electricity Rate > \$0.11/kWh

or

If Annual Maintenance Costs > \$85.00/year

or

If Total Street Light Costs > \$200/year

then

RetroFlex Solar LED Solution

Eliminate Energy Usage
(Solar Energy + Battery Storage + LED Lights)

Reduce Maintenance Costs
(Integrated Components + Vertical Solar Array)

Proven Technology Saves Budget \$\$\$
(Renewable Energy + Energy Efficiency)



Customer Profile

- The customer has existing street lights with poor performance and moderate to high operating costs.
- The customer is interested in energy efficient lighting options.
- The customer owns or leases the street lighting system.

RETROFLEX SOLAR LED TECHNOLOGY

BENEFITS

BENEFITS TO END-USERS

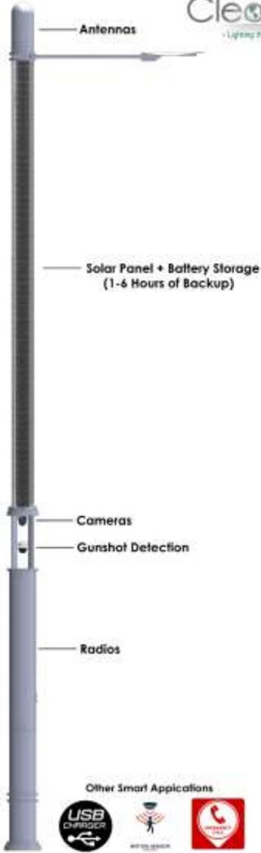
1. SYSTEMS COMBINE RENEWABLE ENERGY + ENERGY EFFICIENCY
2. ELIMINATES CARBON FOOTPRINT
3. RETROFITS TO NEW AND EXISTING INFRASTRUCTURE
4. SOLAR ENERGY & BATTERY STORAGE REDUCE ENERGY DEPENDENCE
5. INCREASED RELIABILITY AND SAFETY DURING ADVERSE WEATHER CONDITIONS
6. ATTRACTIVE DESIGN FOR INSTALLATIONS IN PLAIN VIEW
7. PROGRAMMABLE FEATURES FOR LIGHTING AND COMMUNICATIONS
8. CAPITAL COSTS SAVINGS > 50% (NEW INSTALLS & RETROFITS)
9. RECURRING COSTS SAVINGS > 10% (NEW INSTALLS & RETROFITS)



RETROFLEX SOLAR LED TECHNOLOGY

PRODUCT DIFFERENTIATION

Product Type	RetroFlex	Flat Solar Panel
Design	Aesthetically pleasing cylindrical pole wrap with integrated communications and electronics	Flat Panel on top of the pole
Safety	Firmly retrofit to pole using industry standard hardware, Aerodynamic design minimizing EPA	Large surface area creates high wind risk
Resiliency	Batteries installed within solar array at the top to avoid flooding Flexible Thin Film Panel withstands strong impacts (hail, stones, flooding)	Battery boxes mounted on pole Crystalline panels vulnerable to external impacts
Performance	High efficiency, low light CIGS panels, no maintenance required due to vertical orientation	Tilted panel = dust and snow accumulation; Fixed orientation
Maintenance	No dirt, dust or snow accumulation due to vertical array	Angled panel surface requires periodic maintenance



SMART POLE



Public Safety & Traffic (Cameras)



Other Smart Applications









Environmental Monitoring

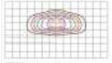
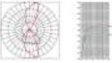
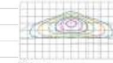



PRODUCT SPECIFICATIONS

SPECIFICATIONS	SINGLE RESIDENTIAL UNITS				DOUBLE HEAD	SINGLE HEAD ROADWAY UNITS							DOUBLE HEAD ROADWAY UNITS		
MODEL #	RS240	RS260	RS320	RS400	RW240	RW260	RW320	RW400	RW540	RW620	RW700	RW480	RW520	RW780	
RETROFLEX (WATTS)	240	260	320	400	240	260	320	400	540	620	700	240 X 2	260 X 2	780	
BATTERY CAPACITY (AMP HOURS)	60	60	75	75	60	60	75	75	90	90	90	60 X 2	60 X 2	75 X 2	
BATTERY PACK (12 + yr life expectancy)	LITHIUM ION	LITHIUM ION	LITHIUM ION	LITHIUM ION	LITHIUM ION	LITHIUM ION	LITHIUM ION	LITHIUM ION	LITHIUM ION	LITHIUM ION	LITHIUM ION	2 LITHIUM ION	2 LITHIUM ION	2 LITHIUM ION	
LED LIGHT (WATTS)	40	40	45	30 X 2	40	40	50	60	80	90	90	40 X 2	40 X 2	60 X 2	
LUMENS PER WATT @ 162	6480	6480	7290	9720	6480	6480	8100	9720	12960	14580	14580	12960	12960	19440	
DIMENSIONS (SOLAR ARRAY)	10.66" OD X 8'6"L	10.66" OD X 8'6"L	10.66" OD X 11'1"L	10.66" OD X 14'5"L	10.66" OD X 8'6"L	10.66" OD X 8'6"L	10.66" OD X 11'1"L	10.66" OD X 14'5"L	10.66" OD X 18'4"L	10.66" OD X 19'L	12.3" OD X 17'L	10.66" OD X 17'L	10.66" OD X 17'L	12.3" OD X 17'L	
WEIGHT (LBS)	134	144	175	200	134	134	175	200	268	334	230	268	268	230	
EPA (SQFT)	7.55	7.55	9.84	12.8	7.55	7.55	9.84	12.8	16.28	16.872	17.425	15.096	15.096	17.425	
POLE SIZES	11" TO 14" (5" DIAMETER)		13'5" AND UP	16' UP TO 26'	STANDARD IS 16' UP TO 26' (5" DIAMETER)					22' TO 26' (5" DIAMETER)			22' TO 26' (5" DIAMETER)		
CAP ARMS	LANTERN	LANTERN	LANTERN	LANTERN	1 STRAIGHT/TAPERED ARMS (4' TO 6')					1 STRAIGHT/TAPERED ARMS (4' TO 6')			2 STRAIGHT/TAPERED ARMS (4' TO 6')		
BASE	8",24"30"			8",24",30"	8",24",30"					8",24",30"			8",24",30"		
LIGHTING & CHARGE CONTROLLER	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT

LUMINAIRE RESIDENTIAL LED HEAD OPTIONS												BASES 8" 24" 30"		
	ACORN	ACORN W/HAT	ACORN WITH CAGE	ACORN WITH HAT & CAGE	ASTURIAS	BILBAO	LIGHT COLUMN	BRAZO	LANTERN	CONTEMPORARY				

LUMINAIRE ROADWAY / COMMERCIAL LED HEAD OPTIONS						
	GOBO L	GOBO F	GOBO T	GOBO A	GAMA T	GAMA L

LUMINAIRE LIGHT OPTICS				
	PATHWAY/TRAILS	ROADWAYS	PARKING LOTS	LANTERN HEADS