



SOLAR INDUSTRY



COOL-PAVEMENT  
INDUSTRY

## TERRA PAVE PRODUCT for

# SOLAR & COOL-PAVEMENT INDUSTRIES

TERRA PAVE PRODUCT is the ECO-FRIENDLY, COST-EFFECTIVE  
SOLUTION to the CHALLENGES in these MARKETS

# TERRA PAVE PRODUCT (SPRAY-ON PERMANENT GROUND COVERING, WATER-BASED POLYMERS)

## TERRA PAVE PRODUCT

- ❖ NON-HAZARDOUS
- ❖ NON-PETROLEUM BASED
- ❖ NON-TOXIC
- ❖ NON-CORROSIVE
- ❖ WATERPROOF
- ❖ EROSION RESISTANCE
- ❖ MAXIMIZE BACKSIDE BIFACIAL ENERGY PRODUCTION
- ❖ NO SPECIAL EQUIPMENT & REDUCES O&M SOLAR FARMS
- ❖ NO HANDLING PROCEDURE REQUIRED
- ❖ >3X TENSILE STRENGTH TO CEMENT



## TERRA PAVE PRODUCT WILL:

- ❖ **SOLVE ALL ISSUES** for the:
  - ✓ URBAN HEAT ISLANDS ISSUE
  - ✓ IMPLEMENTATION of BIFACIAL SOLAR FARMS,
- ❖ **LOWER COSTS** of
  - ✓ O&M for EXISTING SOLAR FARMS, and MUCH MORE ...



# Energy Production for Bi-facial PV

**! IMPORTANT**  
Ground  
Covering  
Materials

Variable,  
Changes



## Bifacial Technology is not only about Module

### Main Parameters to consider:

Albedo	<b>! IMPORTANT</b> <b>#1 PROBLEM</b> ↗
Clearance/height	↗
Racking	No backside shading
Row spacing (GCR)	↗ ( ↘ )
Inverter DC/AC ratio	↘

Racking/tracker



Source: NREL  
**NREL**  
NATIONAL RENEWABLE ENERGY LABORATORY

Inverter

Storage

System integration plays a key role in improving bifacial gain

# Existing Ground Mount Solar Farms Energy Output, (O&M) Operation & Maintenance Costs

**DIRT SOILING & CLEANING**



**VEGETATION CONTROL & MOWING**



**SOLAR PROJECT OWNERS/INVESTORS**  
**Reduction of Output > 5% to 50%**



**SOLAR PROJECT OPERATORS**  
**O&M Costs increase Year-Year to >30%**

**DIRT/DUST CONTROL and VEGETATION GROWTH ELIMINATION**



# TERRA PAVE PRODUCT – Albedo/Cool-Pavement (Spray-on Permanent Ground Covering)



TERRA PAVE Albedo/Cool-Pavement – Water-based liquid polymer

DIRT/DUST CONTROL and VEGETATION GROWTH ELIMINATION

TSW Albedo = SNOW  
365 days/year

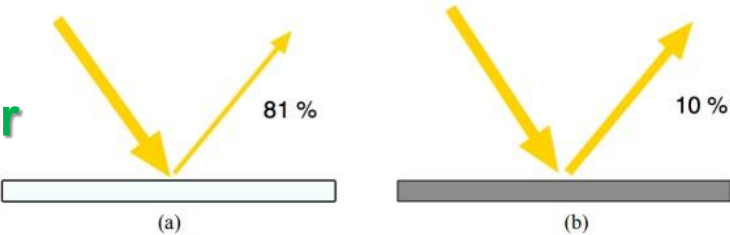
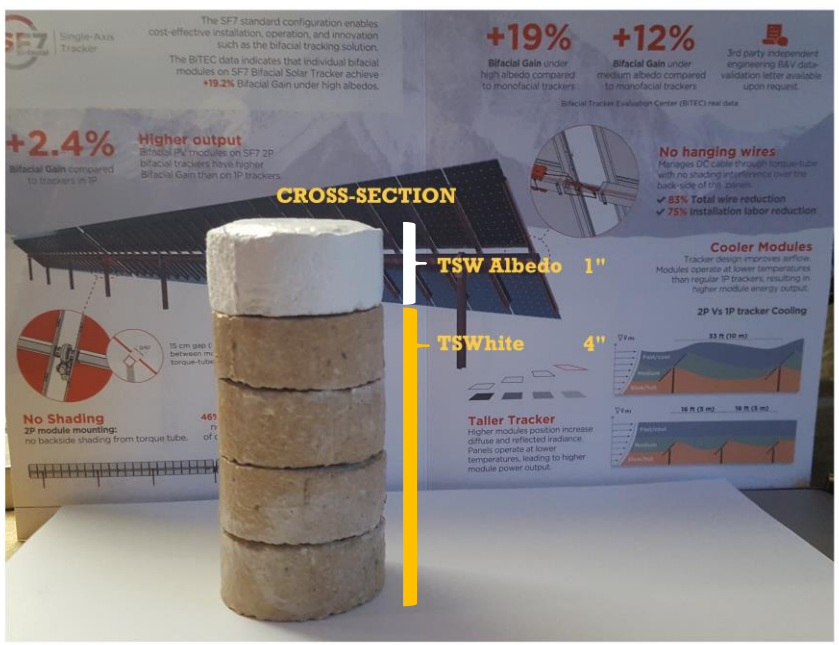


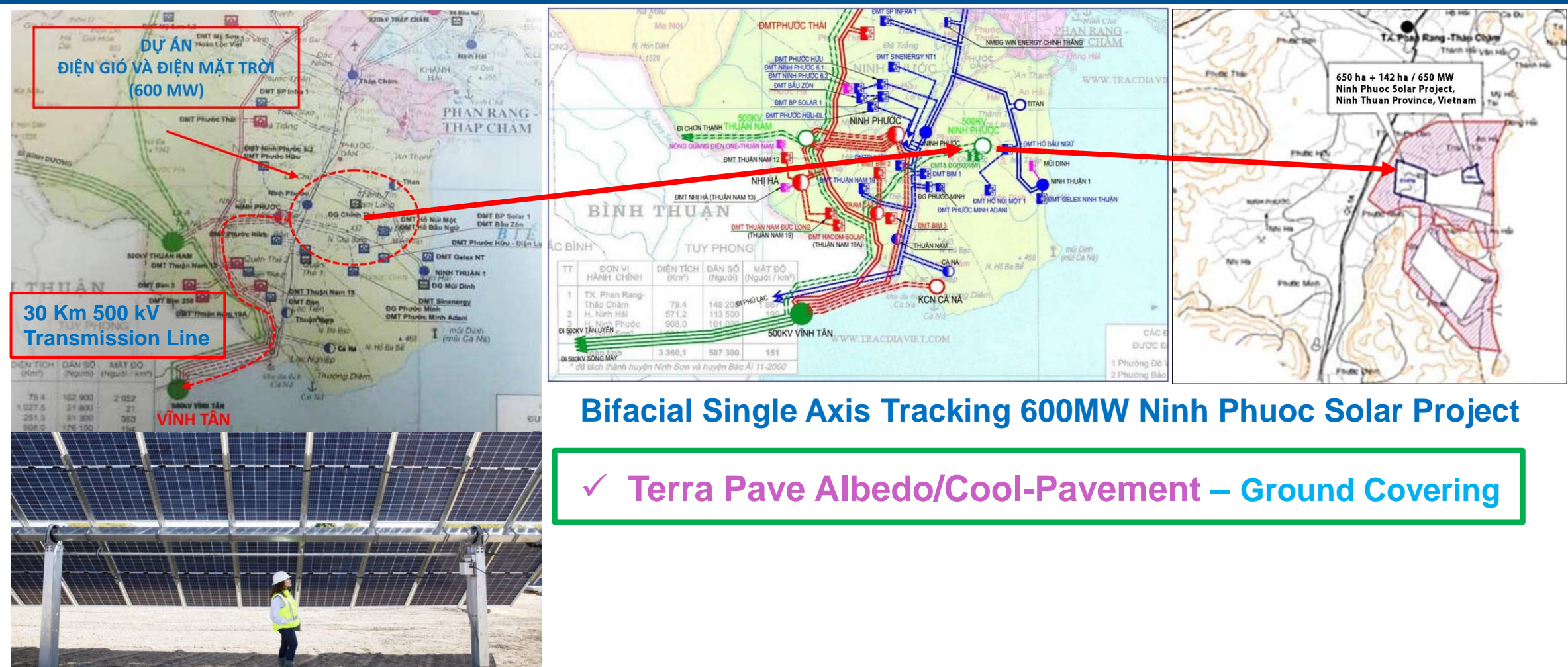
Figure 3. Light reflecting off a surface, where (a) has an albedo of 0.81 and (b) an albedo of 0.1.

Table 1. The albedo of different kinds of surfaces. [17]

Surface type	Albedo
Green grass	0.24
Red brick	0.24
White sand	0.67
Snow	0.85



# 600MW DC Solar + 30Km 500kV Transmission Lines Largest Solar Project in SE ASIA - Ninh Phuoc Solar Project, Vietnam



Bifacial Single Axis Tracking 600MW Ninh Phuoc Solar Project

✓ Terra Pave Albedo/Cool-Pavement – Ground Covering



THE GREENEST & HIGHEST-PRODUCTION/SQM SOLAR PROJECT IN THE WORLD



# 600MW DC Solar + 30Km 500kV Transmission Lines

## Largest Solar Project in SE ASIA - Ninh Phuoc Solar Project, Vietnam



### SOLAR PROJECT DATA EST.:

Cost of TPA application one-time: \$35.3MM USD or \$0.058/Watt

(Albedo) ANNUAL revenue w TPA : ~\$103.506MM USD/Year



(Albedo) ANNUAL revenue w/o TPA: ~\$82.804MM USD/Year

CONSERVATIVELY ~ 20% INCREASE in REVENUE w TPA

Shading/Soiling LOSS w TPA: ~\$4.76MM USD/Year



Shading/Soiling LOSS w/o TPA: ~\$23.806MM USD/Year

CONSERVATIVELY ~ 500% DECREASE in LOSS REVENUE w TPA

ANNUAL O&M Contract YEARLY: ~\$9.522MM USD

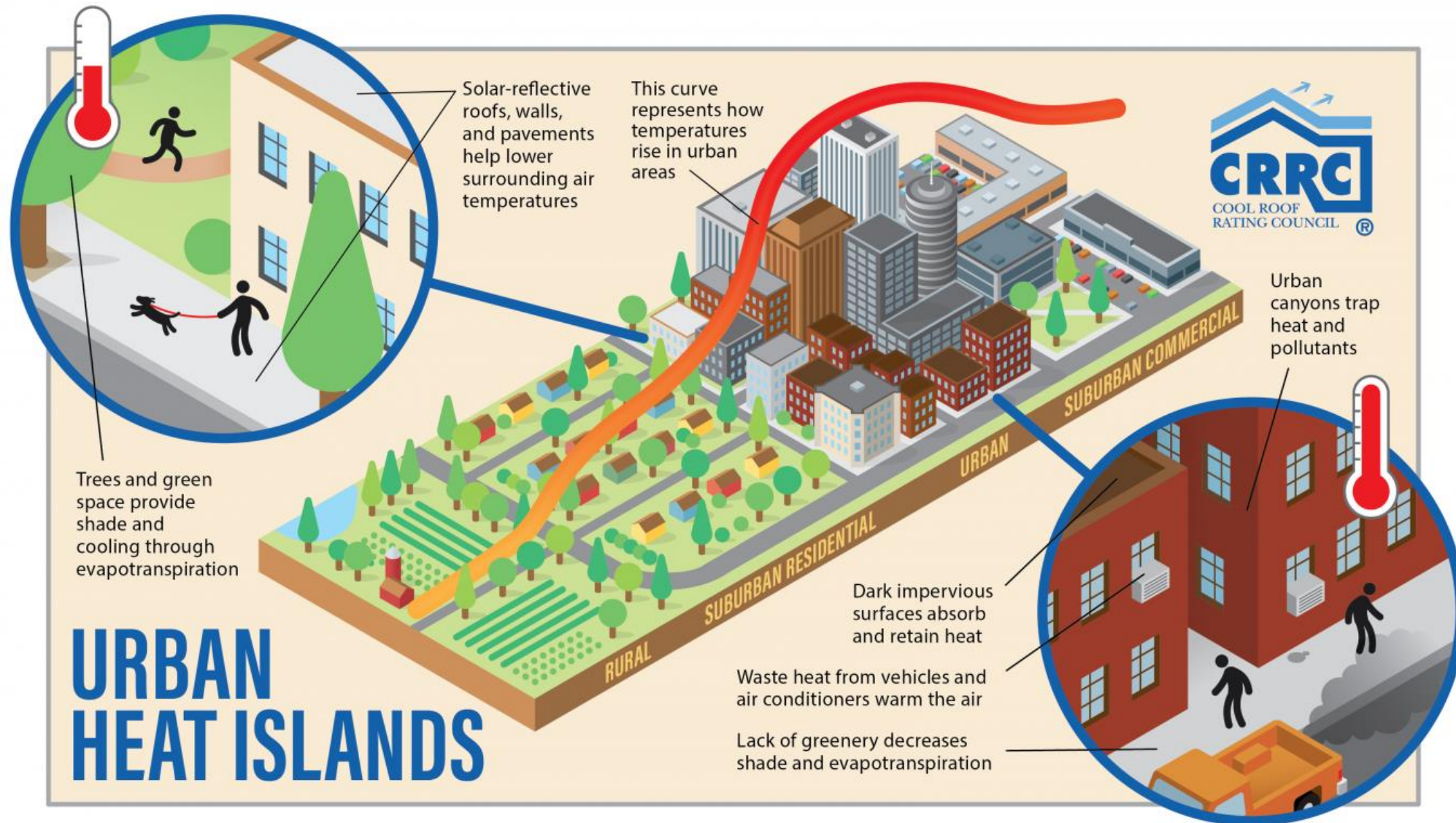
O&M Clean, Weed Costs w TPA: ~\$0.95MM USD/Year



O&M Clean, Weed Costs w/o TPA: ~\$3.142MM USD/Year

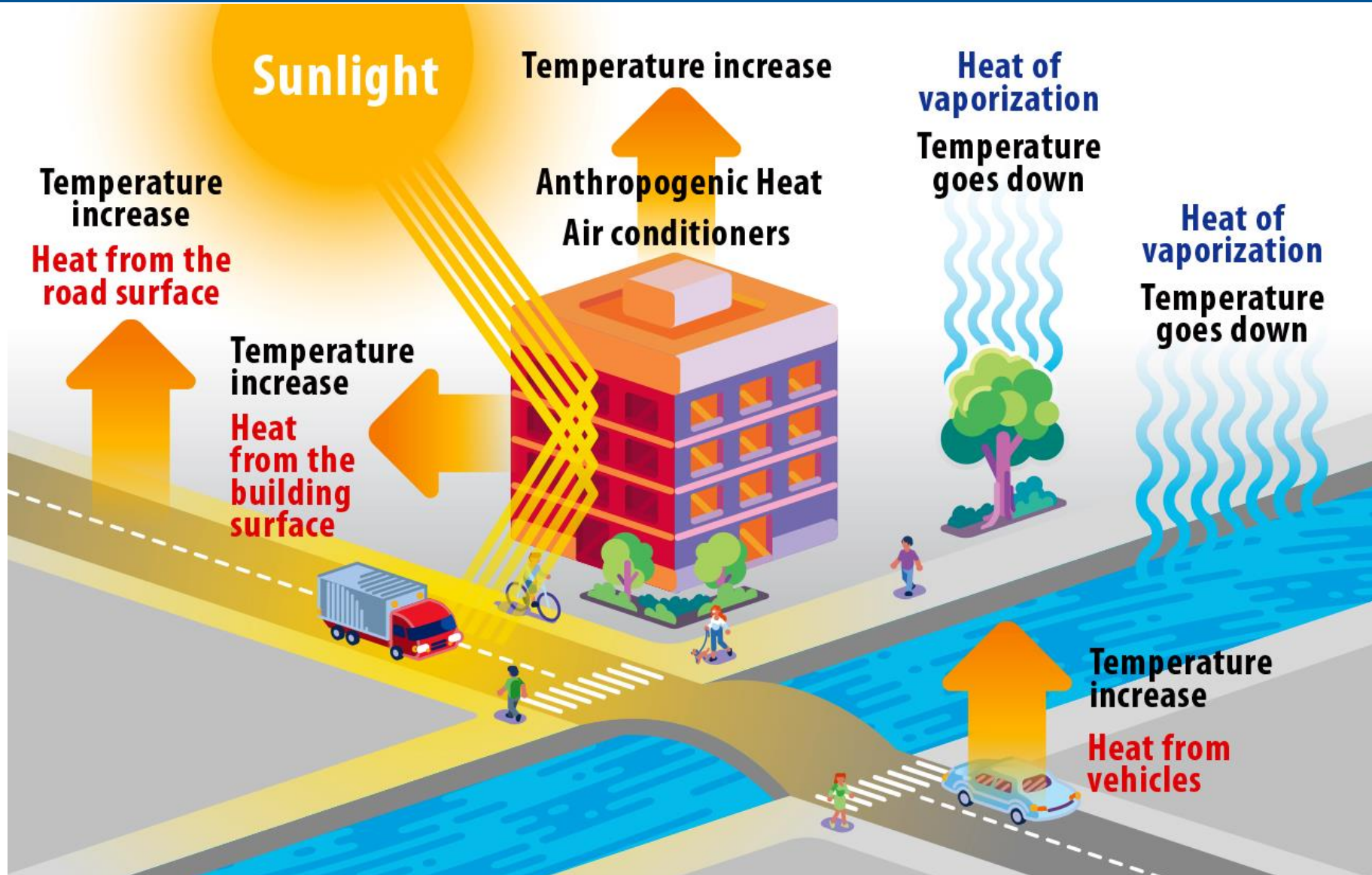
CONSERVATIVELY ~ 300% DECREASE in O&M COSTS w TPA

# URBAN HEAT ISLANDS



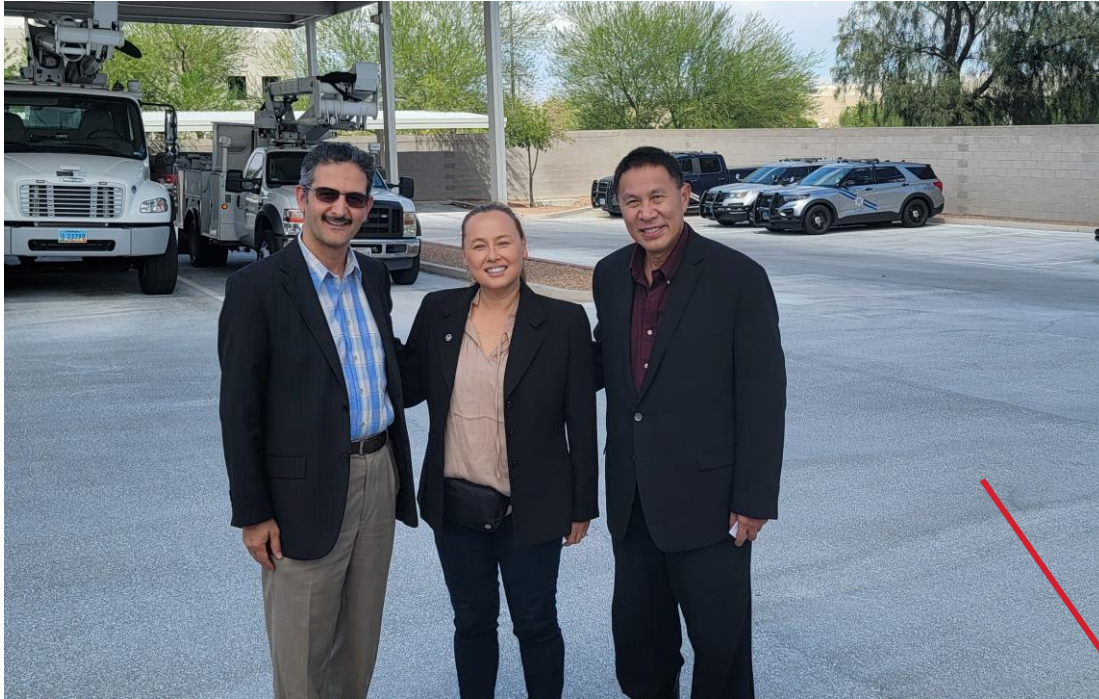


# URBAN HEAT ISLANDS





# Department of Transportation Nevada - Terra Pave Cool Pavement™ (TPCP) (TPCP: 0.03 gal/square yard) = -18 degree F cooler



**COOL PAVEMENT  
TEST**





## Bare Asphalt Road



Asphalt  
Surface  
@ 127.2  
degrees F

- \* Urban Heat Island Mitigation
- \* Makes the roads/pavements Cooler 18+ degree F or more
- \* Energy Saving for the entire city
- \* Improves Air Quality
- \* Improves Health and Comfort for the entire city
- \* Preserves existing Asphalt/Chip Seal
- \* Seals current roads/pavements from Water Penetration to sub-soil
- \* Extends the Life of the roads/pavements +6 years depending on the traffic
- \* Improves Traction and Shorten Braking distance
- \* When cured roads/pavements have a grayish-white color and 100% Eco-Friendly
- \* Climate Change Mitigation

## Terra Pave Cool Pavement Road



Terra Pave  
Cool Pavement  
@ 109.2  
degrees F  
Lowered -18  
degrees F



# PACKAGING

## TP products

55 gallon (208 liter) drums  
275 gallon (1,040 liter) totes





BATTLE TESTED at Army base in Texas



**M1-A2C Abrams Tanks** (each weight in at 73.6 short tons with speed at 73 km/h on road) demonstrated that **TSW > 3X TENSILE STRENGTH** existing products.

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*Thank You!*