

# Praxis Technologies

Products, Services and Concepts  
for a More Sustainable Tomorrow



# Praxis Technologies Inc.

## Definition – (Webster’s Dictionary)

.....the practical application of a branch of learning.....



# Our Mission

Reduce – begin with conservation

Rethink – ‘outside the box’

Renew – balanced sustainability



# Our Solutions

## Power Quality

A perfect sinusoidal wave

Adequate voltage or minimum outage minutes

“ Do my components work?”

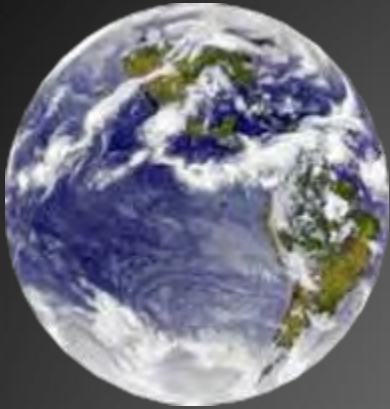
## Sustainability

U.S.G.B.C.

(US Green Building Council)

L.E.E.D.

(Leadership in Energy and Environmental Design)



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# Sustainability

Introduction to USGBC

..... A

Baseline

# USGBC “Green Building” Rating - June 2009

<b>Level</b>	<b>LEED</b> New Construction ( June 2009 )	<b>LEED</b> Existing Buildings Operations & Maintenance ( June 2009 )
<b>Certified</b>	40 - 49	40 - 49
<b>Silver</b>	50 - 59	50 - 59
<b>Gold</b>	60 - 79	60 - 79
<b>Platinum</b>	> 80	> 80

# LEED™ Categories - June 2009

Categories	LEED New Construction	LEED Existing Buildings Operations & Maintenance
Sustainable Sites	26	26
Water Efficiency	10	10
Energy & Atmosphere	35 / 33%	35 / 33%
Materials & Resources	14	14
Indoor Environmental Quality	15	15
Innovation	5	5
Total	105	105



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# Providing Public Electric Vehicle Charging Services for Municipalities

ChargePoint Network Electric Vehicle Charging Infrastructure

NovaCharge – January 2010



# Electric Vehicles are Here, More are Coming



- 2010 - 10 major auto manufacturers with 10 production models
- 2012 - over 20 production models available
- Industry Consensus - 3 Million Plug-in Cars in use by 2015 worldwide



BMW Mini E



Citroen C-Zero



Fisker Karma



Ford Transit Connect



Daimler Smart EV



Nissan Leaf



Hyundai i10



Toyota Prius



GM Chevrolet Volt



BYD F3DM



Ford Focus EV



Mitsubishi iMIEV



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# New Wave of Opportunity



- First wave of vehicles concentrated in metropolitan areas
- Home charging is not enough
  - Many park on street
  - Many park in public garages
  - Limited range of early vehicles
- Opportunity
  - Improve environment
  - Reduce dependence on oil
  - Reduce cost of transportation
  - Happy residents and business owners



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# Some Challenges to Consider



- How to provide open, impartial charging services to all users?
- How to ensure public safety and limit liability?
- How to get paid for electricity?
- How to ensure quality of service without straining maintenance resources?
- How to ensure Smart Grid compatibility?
- How to accommodate a loss in gas tax revenue?
- How to stay current with new technology?
- How to scale with increased demand?



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# ChargePoint Network Solution



ChargePoint Charging Stations

ChargePoint Software Application Services

ChargePoint Network Support Services

ChargePoint Network Operating System



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## Coulomb Technologies ChargePoint® Network



# Provide Open, Impartial Charging Services

- Open access options
  - Credit card
  - ChargePass™ card
  - 24/7 toll free telephone number
  - More coming (i.e., Oyster Card)
- Allow users to roam from city to city
  - Same access methods
  - Regardless of charging service or Utility provider
- Provide entire range of charging
  - Level I
  - Level II
  - Level III



# Protect Public Safety, Limit City Liability

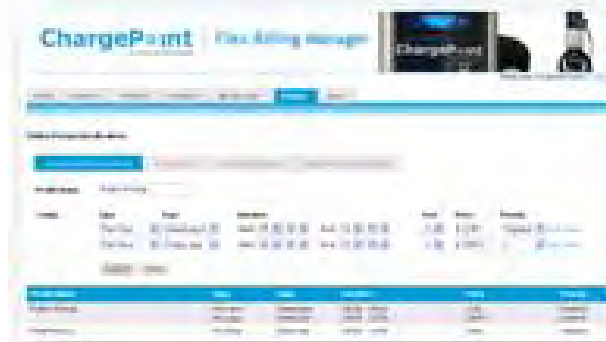
- All products certified to international safety standards
- Charging sessions are only energized when it is safe to do so
  - Authorized access only
  - Automatic GFI detected with retry
  - Automatic cable disconnect detected
  - Locking door for applicable models
- Auto notification
  - Vandalism
  - Wear out
  - Misuse



# Recoup Electricity Costs



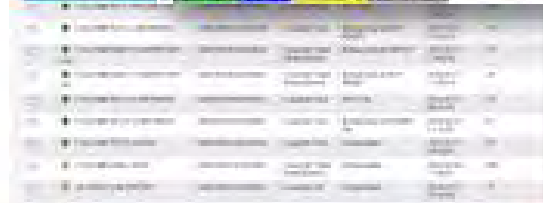
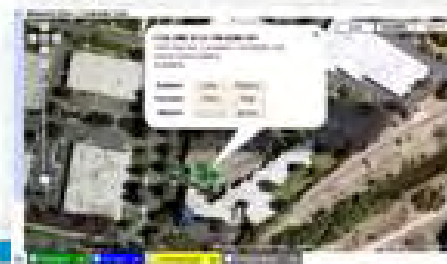
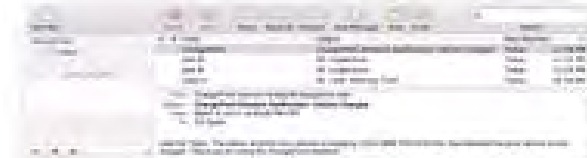
- Flex Billing Manager
  - Choose free, or for-fee access
  - Set pay-per-time (i.e., Parking) pricing
  - Vary price by driver, time of day, calendar day, or combination
- Flex Billing Service
  - Bill drivers
  - Automatic fund transfer



# Provide High Reliability at Low Cost



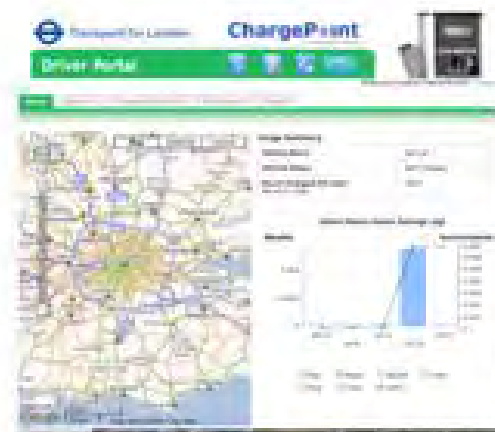
- ChargePoint Network Driver Support Services
  - Email, SMS notifications
  - 24/7 driver telephone support service
  - ChargePoint Network takes care of drivers for you
- ChargePoint Network Service Manager
  - View alarms, status
  - Remote diagnostics and control
  - Minimize truck rolls - only send maintenance staff if necessary



# Enable New Revenue Sources



- ChargePoint Network Driver Portal
  - Attract environmentally conscious visitors and residents
  - Enable drivers to locate charging station locations in the city
  - Brand and advertise city services



# Start Now, Be Prepared for the Future

- Full range of charging
  - Level I
  - Level II
  - Level III
- Remotely upgrade charging stations to implement new car charging requirements
- Scale from 1 to thousands of charging stations with single network





# Plug-in Hybrid Charging Station



## After HSAD: Composting

Unlike incineration, which leaves behind a hazardous waste that must be disposed of, or landfilling, which allows organics to rot without capturing their nutrient potential, HSAD's end residue is high-quality **compost**.



HSAD

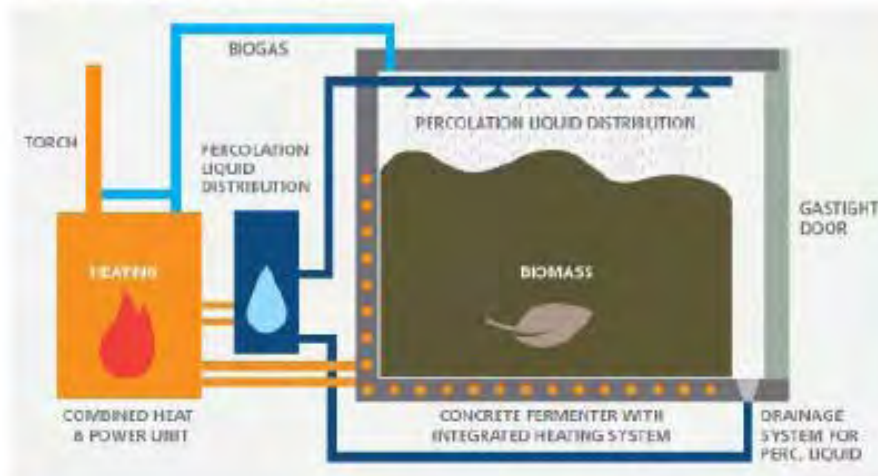


High-Quality Compost

*Compost is produced from the organic matter, called digestate, that remains after the HSAD process.*

## High-Solids Anaerobic Digestions (HSAD)

HSAD consists of the breakdown of organic matter without oxygen, using naturally-occurring bacteria:



The result? Clean, renewable energy.

1. Incoming food and yard waste is lightly screened and mixed.
2. Organic material is sealed inside the digester for up to 28 days. The seal is gas tight, allowing biogas to be harvested.
3. The liquid from the organics is collected and re-circulated through the material to facilitate gas generation.
4. Harvested biogas is then converted into electricity, renewable natural gas, or renewable transportation fuel.

## Technology Review: HSAD



1. Organic waste received in enclosed tipping hall
2. Front-end loaders load feedstock into batch digesters. Each processes ~3,000 tpa and the design is modular
3. Microorganisms digest material for three to four weeks, continuously producing biogas
4. Treated material (digestate) is aerobically composted for two to four weeks to produce high-quality soil products
5. Finished compost is screened for contaminants
6. Compost products are sold for agricultural, horticultural, or erosion control uses
7. Renewable electricity generated from biogas used in CHP unit
8. All building and process air is treated in biofilter to eliminate odor
9. Process liquids are recycled on-site in a closed loop system to facilitate the digestion process
10. Totally enclosed facility is suitable for urban and suburban locations

Proprietary & Confidential

eliosolar

Architectural sun-control and shading devices that contain an integrated solar thermal collector that generate free solar hot water



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Reduce.....Rethink.....Renew<sup>©</sup>  
KEDANCE.....KERUUK.....KELLEM



# Transforming your parking structures into power plants

University of California, San Diego Solar Grove™  
Gilman Parking Structure Solar Grove™  
(Inset) Hopkins Parking Structure Solar Grove™



## SOLAR TREE™

- Each Solar Tree™ shades eight (8) standard parking spaces
- System supports a variety of module types
- Easily deployed on existing structures or new construction
- Integrated Wire Management System
- 14.7 kW (DC) size system
- \$6.00 to \$7.00 per Watt ballpark estimate for structures and PV - other costs include labor, foundations, supporting electrical and lighting



Reduce.....Rethink.....Renew



## Transforming your parking structures into power plants

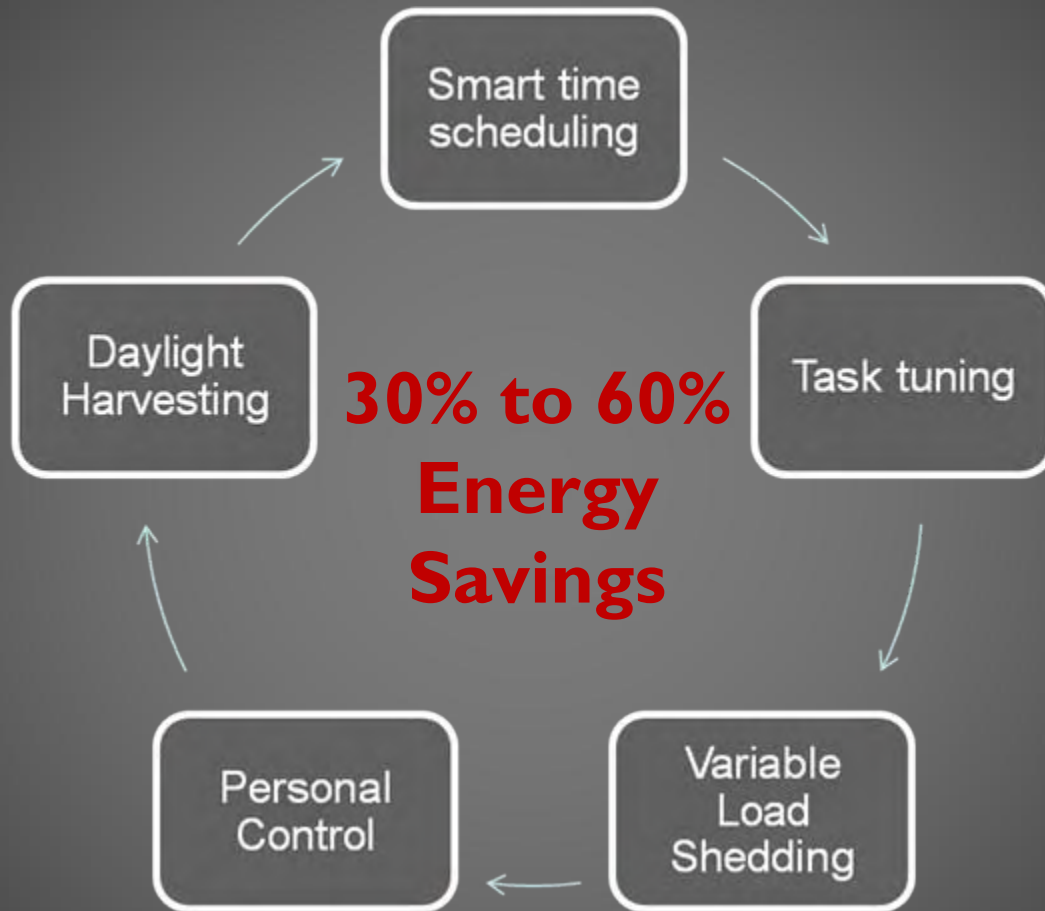


## SOLAR ROW™

- Each Solar Row™ shades six(6) standard parking spaces
- System supports a variety of module types
- Easily deployed on existing structures or new construction
- Integrated Wire Management System
- 14.65 kW (DC) size system \$5.00 to \$5.50 per Watt ballpark estimate for structures and PV - (other costs include labor, foundations, supporting electrical and lighting - installation)



# Strategies for Lighting Control

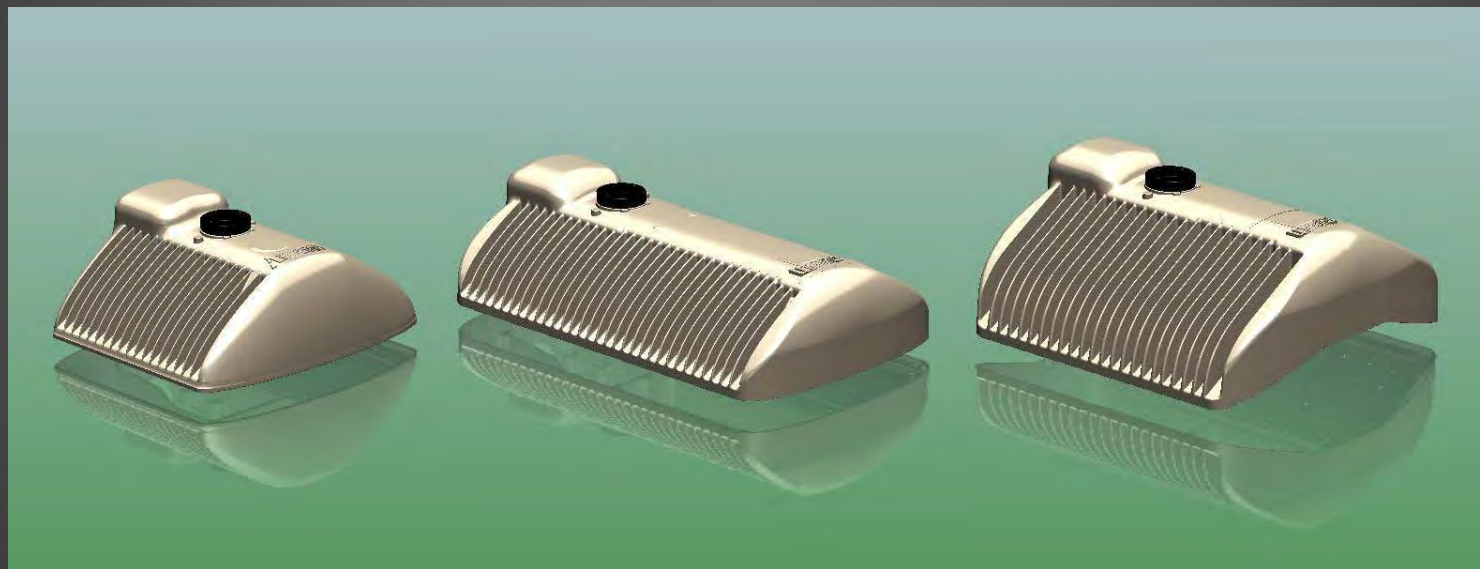


# Lumen Output Range

SAT-S (Small)  
24 or 48 LEDs

SAT-M (Medium)  
72 or 96 LEDs

SAT-L (Large)  
120 or 144 LEDs



1,772

20,482

# LED ROADWAY LIGHTING

Leading the LED technology wave

## San Francisco - 64% Energy Savings



245 Watts

HPS - 200W Bulb

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88 Watts

Satellite™ 96 LED-

Reduce.....Retire.....Renew ©  
200mA



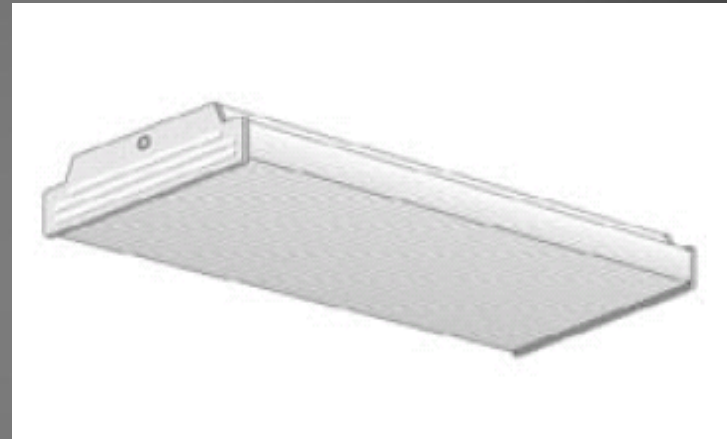
Wedge Dome



Reduce.....Rethink.....Renew<sup>©</sup>  
Reduce.....Rethink.....Renew



Comprehensive  
line of high  
efficiency light  
fixtures for retro  
fit and new  
construction



POWERSMITHS

# Energy Efficient Transformers

## Measurement & Verification (WOW)

P O W E R F O R T H E F U T U R E



GREEN TEAM

# High Performance Green Building



# Our Technology Platforms

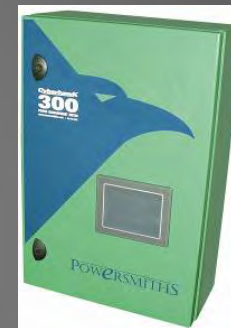
## High Efficiency/Performance Transformers

- Cut operating cost for 40 years plus
- Embed energy conservation & reduce footprint



## Measurement & Verification

- Enables Resource conservation by measuring use
- Validate building system performance
- Automate carbon footprint with live data



## Power Distribution Systems

- Efficient Compact Power Distribution
- Reduces operating cost (lower total cost of ownership)
- Harmonic Treatment



## Sustainability Management Platform

- Use Building systems as a teaching tool
- Visualization engages a wider audience
- Track building energy & performance
- Carbon footprint outreach

