WIRELESS POWER EXPERT

GREEN POWER

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WHY GREEN POWER?

Green Power is the obvious choice for smart electric power supply solutions for wireless transmissions and plug-in applications, as well as smart power grid integrations. We proudly provide customers with exceptional technology and advanced solutions guaranteed to produce significantly higher efficiency, safe, reliable operations and minimal maintenance costs.

ABOUT GREEN POWER

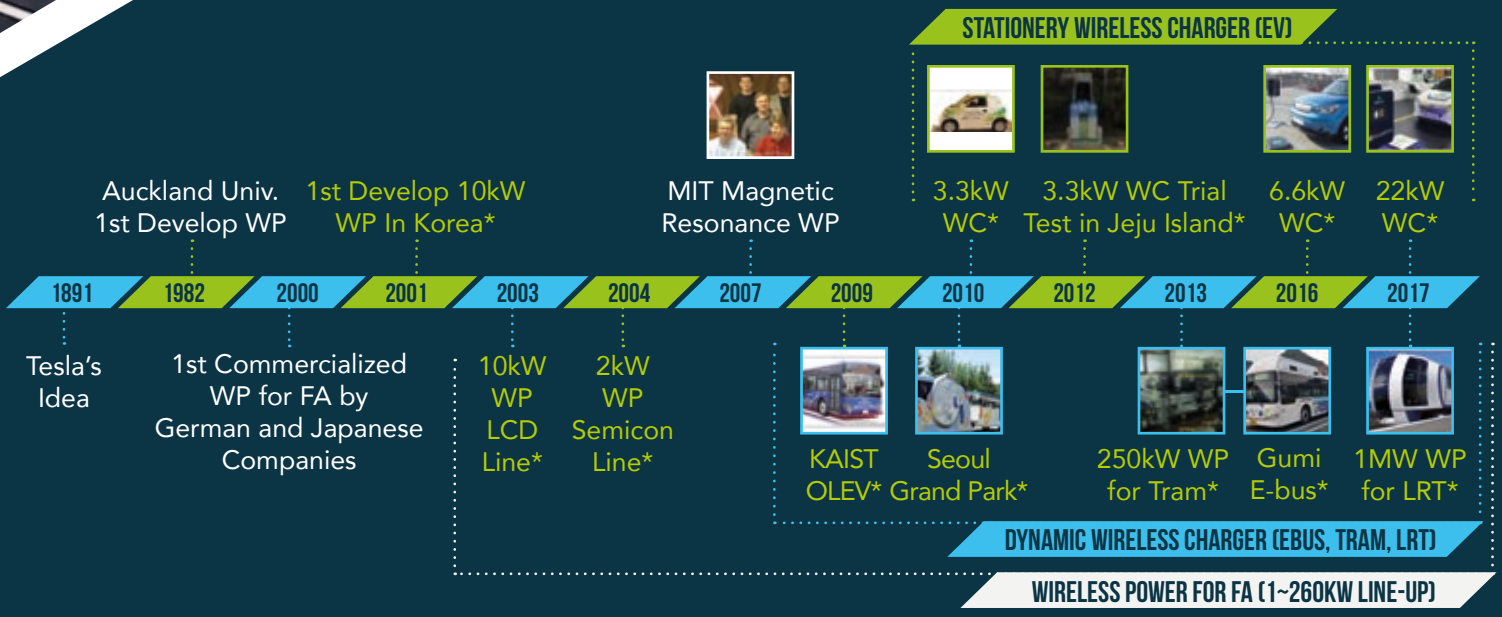
Green Power Corporation has been a global leader in the field of high-power wireless technology since 1998. We have developed and delivered massive wireless power for electronically-powered handling equipment used in semiconductor, LCD/OLED and automotive lines to food and drug lines and everything in between.

Never satisfied with the status quo, we continually focus on R&D and global opportunities. The proof in this is the development and commercialization of wireless charging for vehicles and buses, as well as roadway-powered dynamic wireless charging for electric buses and trams. Our goal is to always stay a step ahead of the industry in this era of smart mobility.

As we move into the future, Green Power will continue to be a leader in the field of wireless power technology and is committed to putting customers first and maintaining high-quality production, while cultivating a spirit of challenge and ingenuity among our employees.

WORLD HISTORY OF WIRELESS POWER TRANSMISSION

*GREEN POWER ACHIEVMENTS IN GREEN



COMPANY HISTORY

2018 → **What lies ahead**
Creating new wireless power market and expanding market share

- Developing electric truck and electric bus wireless charging
- Development of port logistics wireless charging
- Developing electric railway wireless charging
- Acquired OLEV division of Dongwon Construction
- Awarded $ 30 million Export Tower

2009-2017 **Stabilization Phase**
Stabilization of factory automation products and diversification of products for electric vehicles

- OLED adds wireless power for automotive line
- Add wireless power for AGV
- Entry into overseas market (Japan, China, Taiwan)
- Acquired $ 10 Million Export Tower (2017)
- KAIST OLEV-BUS core technology development
- Developed 3.3kW / 6.6kW wireless charging for EV

2004-2008 **Growth Stage**
Focused on product performance improvements

- Addition of 2kW high density wireless power for semiconductors
- LCD Capacity Lineup: 10~50kW Delivery to Samsung Display

2001-2003 **Entry Stage**
Wireless power technology Localization challenge

- Developed 10kW wireless power for factory automation for the first time in Korea
- First supply to Samsung 5th generation LCD line

1998 - 2000 **Inception Phase**
Began as a small business venture inside the Korea Electric Research Insititue (KERI)

- Development of high-frequency resonant inverter
- Developed high-efficiency high-density power supply

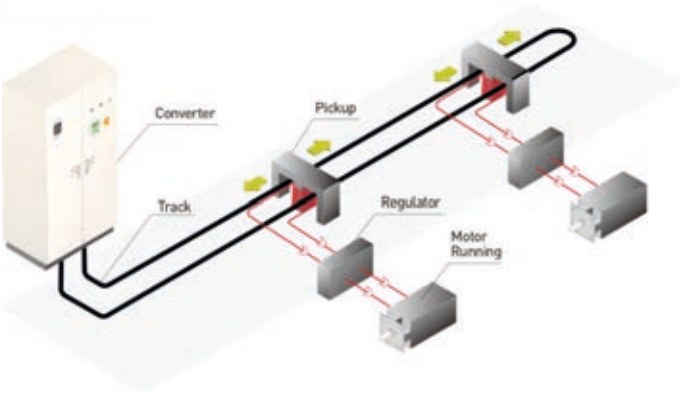
WPS™ (WIRELESS POWER SUPPLY)

FACTORY AUTOMATION

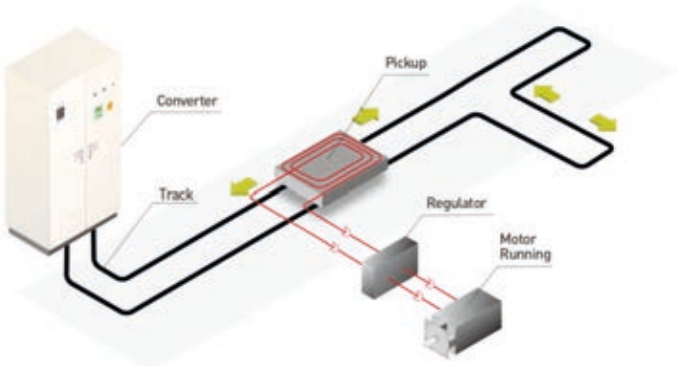
What is WPS™?

Without any mechanical or physical contact, our Wireless Power Supply (WPS™) provides continuous electric power both rail and floor monted which propels vehicles along a track based on the magnetic induction principle.

RAIL MOUNTED WPS



FLOOR MOUNTED WPS



Particle Free
Improvement of Semiconductor Yield & Work Environment

Maintenance Free
Cost Savings

High Speed
Increasing Productivity

Mechanical Tolerance
Longer Lasting Equipment

WPS™ APPLICATION FOR

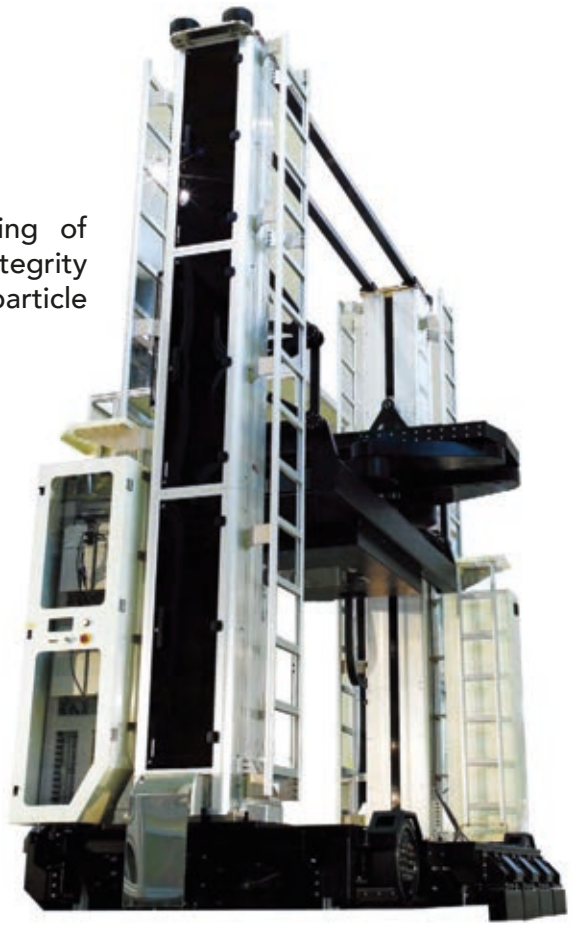
STOCKER CRANES

WPS™ technology ensures automatic storing and retrieving of conatiners smoothly and with stability, while protecting the integrity of the glass panel through low vibrations and the control of particle emissions.

BENEFITS

- No sparks or noise
- High speed
- Eco unit with safe and slow stop
- Entirely maintenance-free
- Suitable in clean rooms

E-TYPE PICKUP



WPS™ APPLICATION FOR

OHS/OHT/EMS

Our wireless power technology for OHS/OHT/EMS provides particle free and flexible design layouts which improve transport efficiency while maintaining high speed with its new state of the art steering system.

BENEFITS

- Fail-Over function supported
- Easily expandable
- Entirely maintenance-free
- Suitable in clean rooms
- Soundless
- Various safety options (i.e Supercapacitor Bank)

H-TYPE / E-TYPE PICKUP

U-TYPE PICKUP

WPS™ APPLICATION FOR
AGVS

Our wireless power technology for floor-guided automated transport systems smoothly transports containers directly to stockers or process equipment. Advantages include increased of productivity and extended battery life. AGV can easily travel through complex patterns using a high-precision navigation system.

BENEFITS

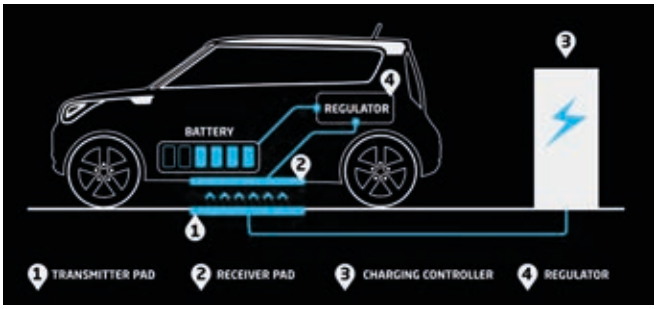
- Complex track layouts possible
- Barrier-free track path
- Easy battery or ultra-cap change in transit
- Cost saving battery change
- Entirely maintenance-free
- High availability
- Dirt-resistant
- Suitable in clean rooms
- Soundless

FLAT-TYPE PICKUP

WPT (WIRELESS POWER TRANSFER)
AUTOMOTIVE/TRAIN

WIRELESS CHARGER FOR PASSENGER CARS

(Stationary WPT)



FEATURES
- Magnetic coupling power transfer
- Automatic, plug-free charging
- Same over 90% efficiency and charging time as plug-in chargers
- 3.3 kW - 22kW power options

BENEFITS
- Park and charge automatic charging (no buttons, no cable, no plug!)
- No dirty, hot/cold plugs and wires
- Highly convenient for everyone

RX & TX PADS

TX-Pad

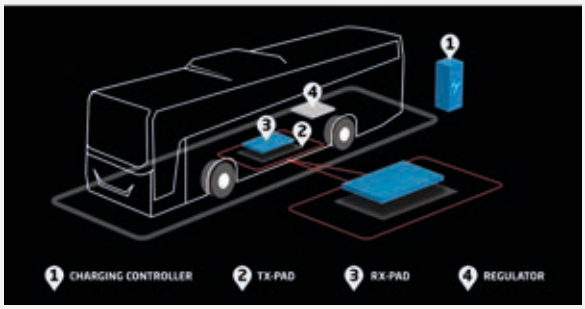

RX-Pad


Regulator


Charging Controller

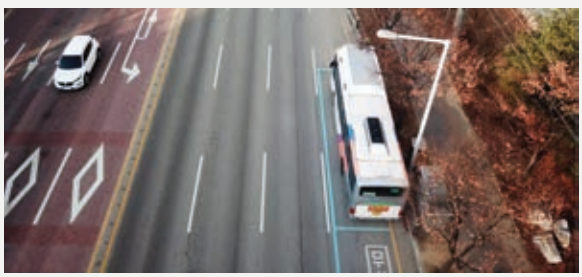
WIRELESS CHARGER FOR E-BUSES

(Stationary WPT)



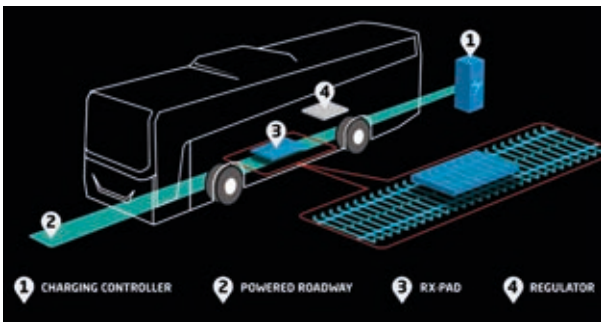
FEATURES
- Magnetic coupling power transfer
- Automatic, plug-free opportunity charging at stops or garages
- Same over 90% efficiency and charging time as plug-in chargers
- 50 kW - 100kW power options

BENEFITS
- Automatic charging at E-bus stops
- No dirty, hot/cold plugs and wires
- Ideal for static, en-route charging



ROADWAY WIRELESS CHARGER FOR E-BUSES

(Dynamic WPT)



FEATURES

- Smaller battery options
- Magnetic coupling power transfer
- Automatic, TX track charging

COMMERCIAL OPERATIONS

6 Buses are commercially being operated in Daejon and Gumi, Korea

ROADWAY WIRELESS CHARGER FOR TRAMS

(Dynamic WPT)

FEATURES

- Magnetic coupling power transfer
- Drawing power from TX-track in transit
- Smaller 65 mm air gap
- High power, over 90% high efficiency transfer

BENEFITS

- No overhead component needed
- More aesthetically pleasing
- Safe, wireless power transfer
- Fewer components equal lower maintenance
- Weather-resistant
- Higher transport capacity

TRIAL TEST: WORLD 1ST COMMERCIALIZED TRAM AT SEOUL NATIONAL PARK

- Tram Length : 45m
- Seats : 120
- Track segment : 25m
- Air Gap : 120mm
- Power : 60kW (15kW x 4)
- Efficiency : 73%
- Speed : 20km/h
- EMF : Exceeded ICNIRP 1998

TRIAL TEST: HIGH POWER WPS FOR TRAM

- Tram Length : 36m
- Seats : 60
- Track segment : 1km
- Air Gap : 65mm
- Power : IMW
- Efficiency : 90%
- Speed : 40km/h
- EMF : Exceeded ICNIRP 1998

WPT (WIRELESS POWER TRANSFER)

PORT

RTGCS

Our wireless power technology has revolutionized effectiveness of RTGC systems with the capability of one inverter power-sharing and effortless transporting among vertical or horizontal array ports for more efficient automation. Our system makes the cabled RTGCs obsolete. We are also far ahead and offer more benefits than the contacted rail system including freedom of mobility, speed and the ability to save regenerative energy.

AGVS

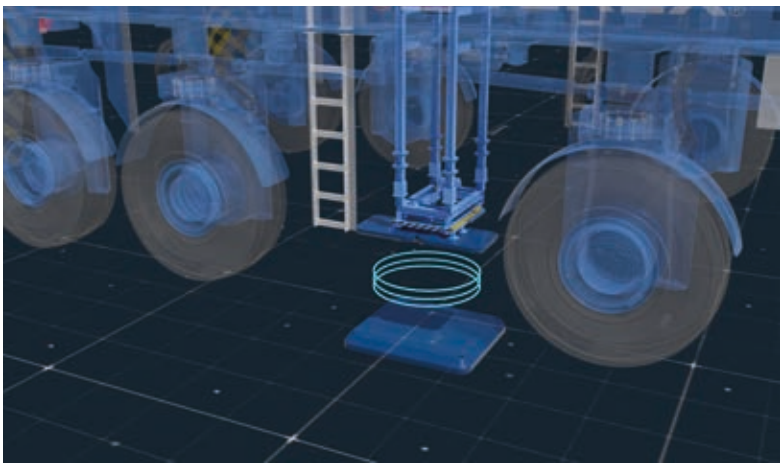
Our wireless power technology introduces opportunity charging mechanisms which makes traditional plugin charging and battery-swapping AGVs much more inefficient. Our system virtually eliminates the danger of batteries draining while extending the life of the batteries. It also has the capability of using one inverter with multiple units or with basic 1:1 ratios, depending on our customers' needs.

YARD TRACTORS

Flexibility is the benefit for yard tractors using our wireless power with the option of three unique charging points depending on our customers' needs.

SHUTTLE CARRIERS

Our wireless power technology improves shuttle carrier performance by introducing its opportunity-charging mechanisms allowing anytime charging to virtually eliminate the danger of batteries draining, along with the capability of using one inverter with multiple units or with basic 1:1 ratios, depending on our customers' needs.



PLUG-IN CHARGER TECHNOLOGY

AUTOMOTIVE FAST CHARGERS

100KW 2CH DUAL CHARGER

General Info
Power: 120kW max. 500V,240A
Size: W500 x D806 x H1530 (mm)

Charging time
15min, 100kW Battery 28kWh standard
30min, 50kW Battery 28kWh standard

Technical Features
User-friendly design design
Maximium space utilization
Server infrastructure system interworking
12-inch wide LCD touch screen
Smart protection / Emergency stop function

Additional Info
Temp: -20°C ~ 50°C
Humidity : ~95%
KC certification, IP44 protection grade and SAE J1772 charge standard

200KW 1CH OR 2CH CHARGER

Output
1CH: 200kW max.
2CH: Each max. 100kW + 100kW

Charging time
80 minutes, based on 200kW / Battery 256kWh

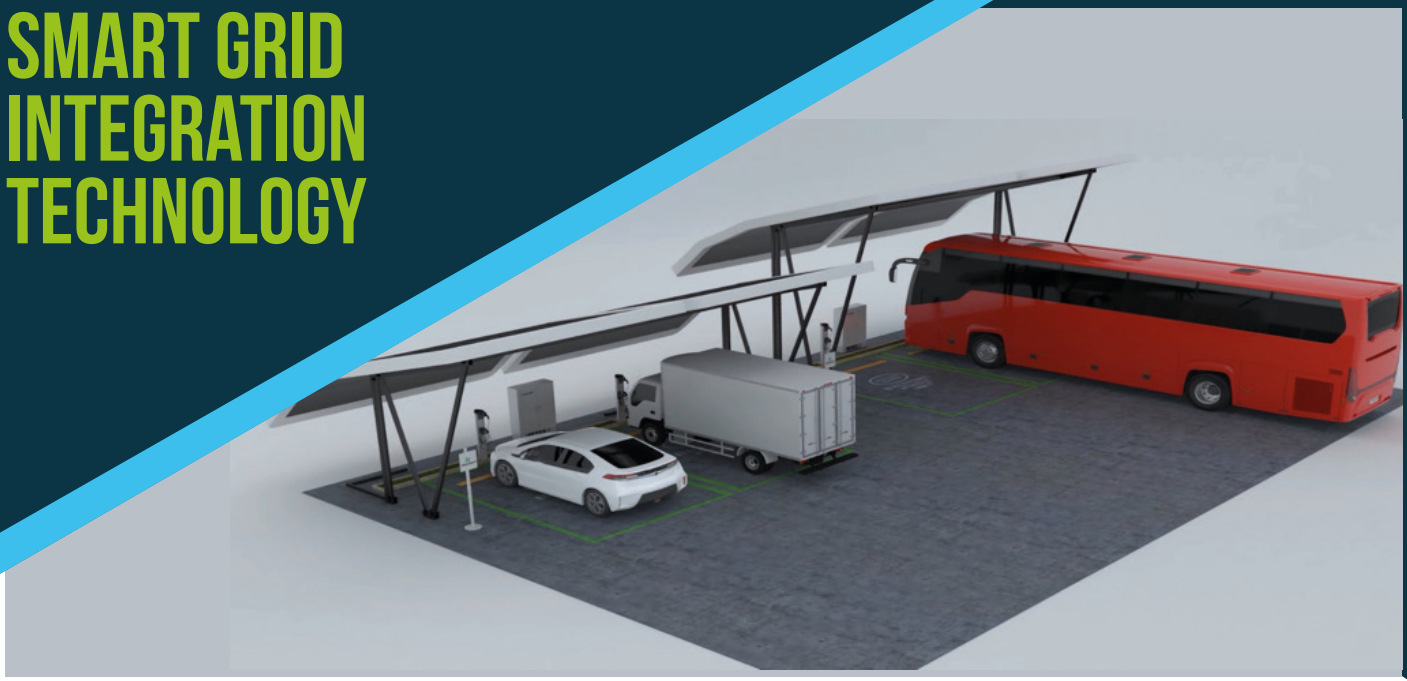
Environmental conditions Temperature: 20 ° C to 50 ° C Humidity: ~ 95%

Lineup
Combo 1&2
300kW 2CH with combo 1 for E-bus

Product Features

- Intuitive GUI application and application integration
  → Increased convenience to user
- RFID, touch input method applied
  → Multiple user authentication options
- Server infrastructure system construction
  → Increased charger manageability
- Unique, attractive design options
  → Adds to local aesthetics
- Slide replacement parts
  → Increased maintenance convenience

SMART GRID INTEGRATION TECHNOLOGY

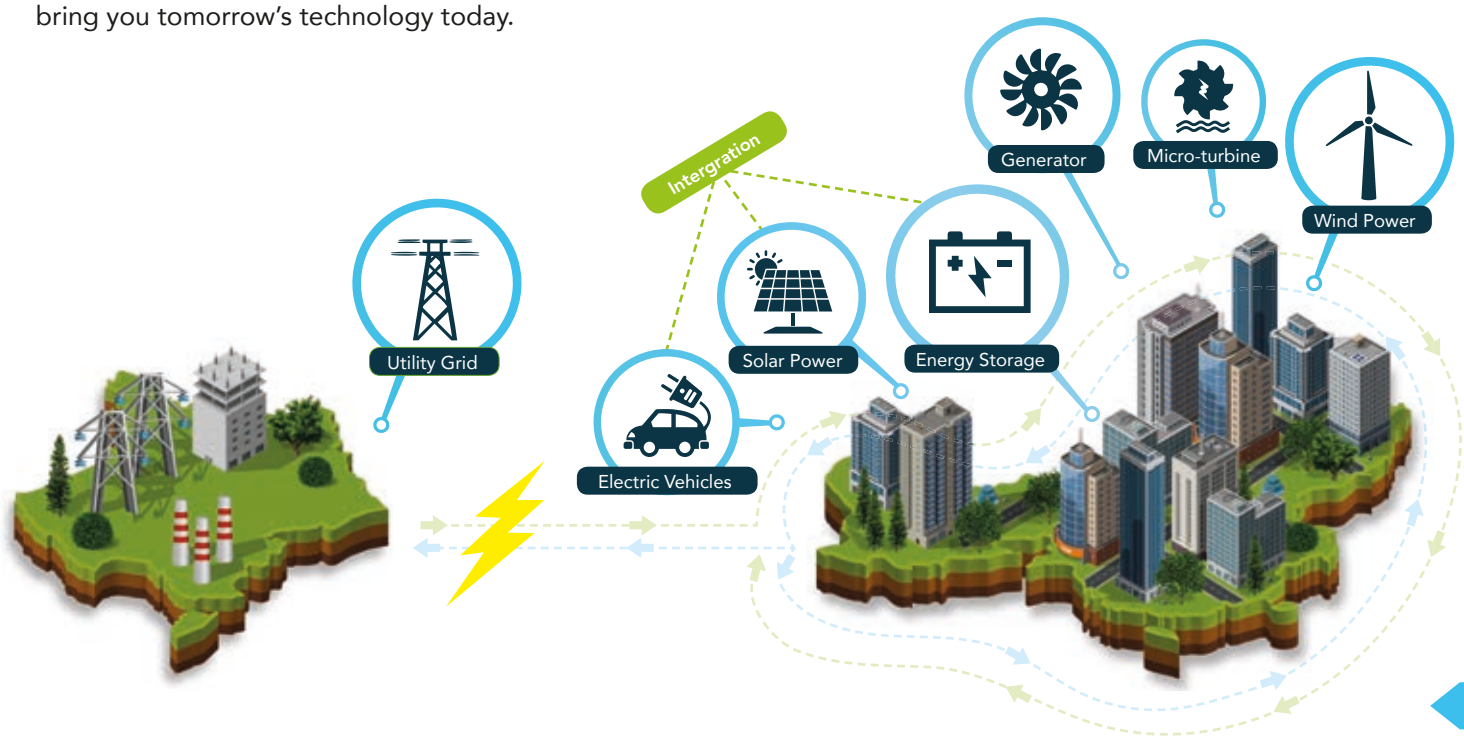


RENEWABLE ENERGY

Green Power's proprietary 3 in 1 technology integrates Photovoltaic, Energy Storage System and Electric Vehicle Charger into one inverter. This system puts us at the forefront of the renewable energy industry. It is also cost-effective, highly efficient and offers a new attractive business model.

MICRO GRID

Smart grid integration technology by Green Power gives the Microgrid to power to allow more efficient operations, which in turn leads to lower operating costs. We will never stop working to bring you tomorrow's technology today.



REPRESENTATION

Green Power's influence is far-reaching in the field of wireless power technology whether it's used in semiconductor/LCS and automotive lines or electric cars, buses and trams.

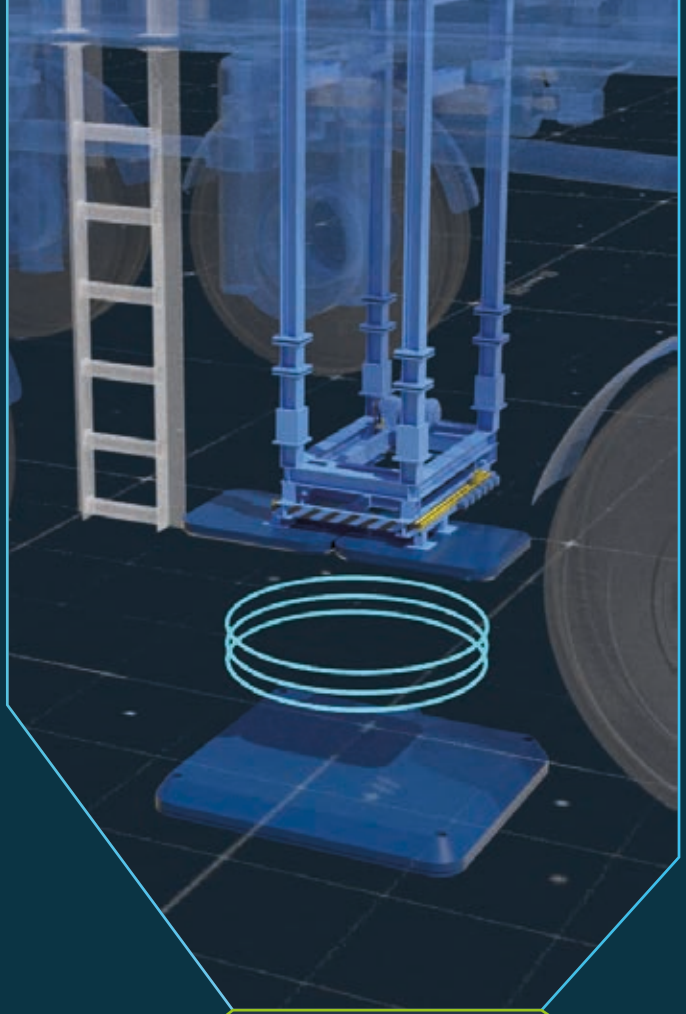
CERTIFICATES & AWARDS

ISO 14001
ISO 9001
IEC 61980

PARTNERS

Green Power's list of clients is a virtual who's who of global leaders in the industries around the world. We are always attuned to the diverse needs and demands of all of our customers.

SAMSUNG · SK hynix · SFA · shinsung FA · BOE · HYUNDAI SAMHO HEAVY INDUSTRIES CO.,LTD
HYUNDAI · KIA · IHI · LG Display · SEMES
华星光电 CSOT · TIANMA · CHIMEI



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