



Introducing the **World's First and Only**

Ferraris efficiency applications for Electric energy

June 2020



## **Ferraris efficiency augmentor module for Electric energy**

To better explain where and how Ferraris products are utilized to Customers, Strategic investors and Financial investors, Ferraris products and its uses have been summarized below. Ferraris have multiple efficiency applications tested runs in majority of its potential usage.

If Ferraris product interests your good company and would like require Information Memorandum for in depth analysis for investment, please feel free to contact [tech-sales@ferrarispower.com](mailto:tech-sales@ferrarispower.com) at your earliest convenience.

## Ferraris Challenge



Ever since the commercialization of electricity, there have been an untapped byproduct in form of electromagnetic field generated by flowing currents in power lines. By harnessing the forgotten and unused electromagnetic energy through electromagnetic energy recycling, Ferraris has opened a new pathway for electric power generation and energy recycling technology for the mankind. Ferraris was founded in a strive to harness the power from a magnetic field produced by power lines and transform it into a reliable and countable power source.

Dr. KOO, who is the founder of Ferraris wishes the investors to set their focus and priority environmental social governance with key focus on providing clean energy produced by Ferraris' products through the magnetic energy over the corporate management of Ferraris. The prime directive of Ferraris is to provide clean energy with no environmental pollution around the world to improve and restore environment for the benefit of current and future generations to come.

We have named Ferraris Inc. in memory of Galileo Ferraris.



## *Table of Contents*

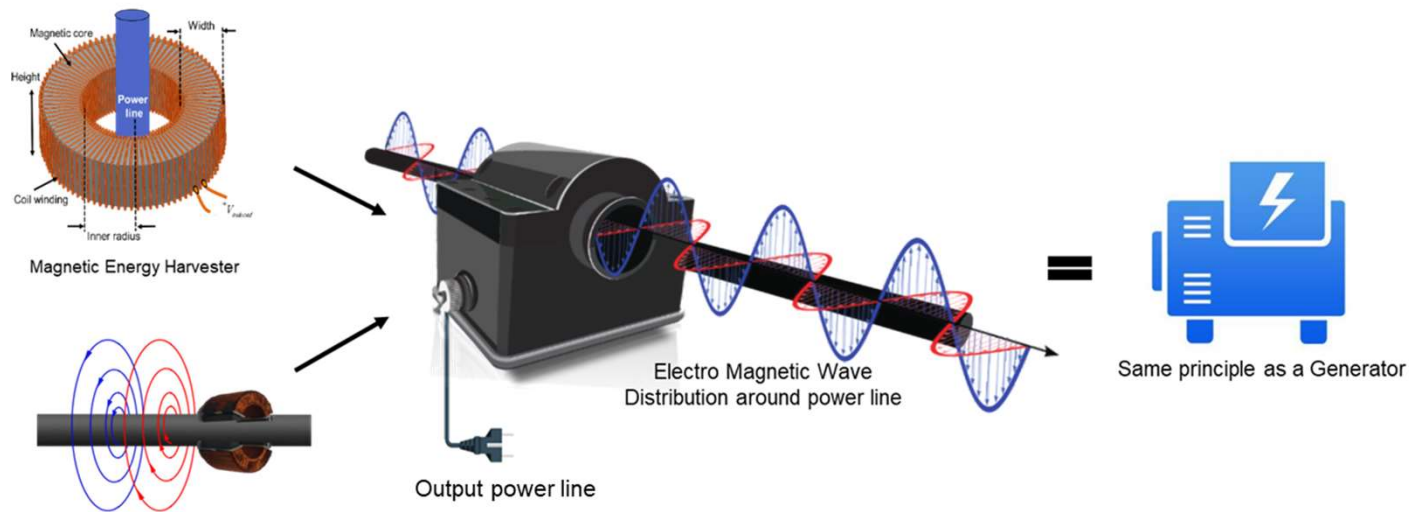
I. Introducing Ferraris products .....	1
II. Power application using the Ferraris Tolenoid C® ....	9
III. Power application using the Ferraris ERR System ..	18
IV. CEO Biography .....	26

## **I. Introducing Ferraris products**

# 1. Ferraris Tolenoid C<sup>®</sup> Technology

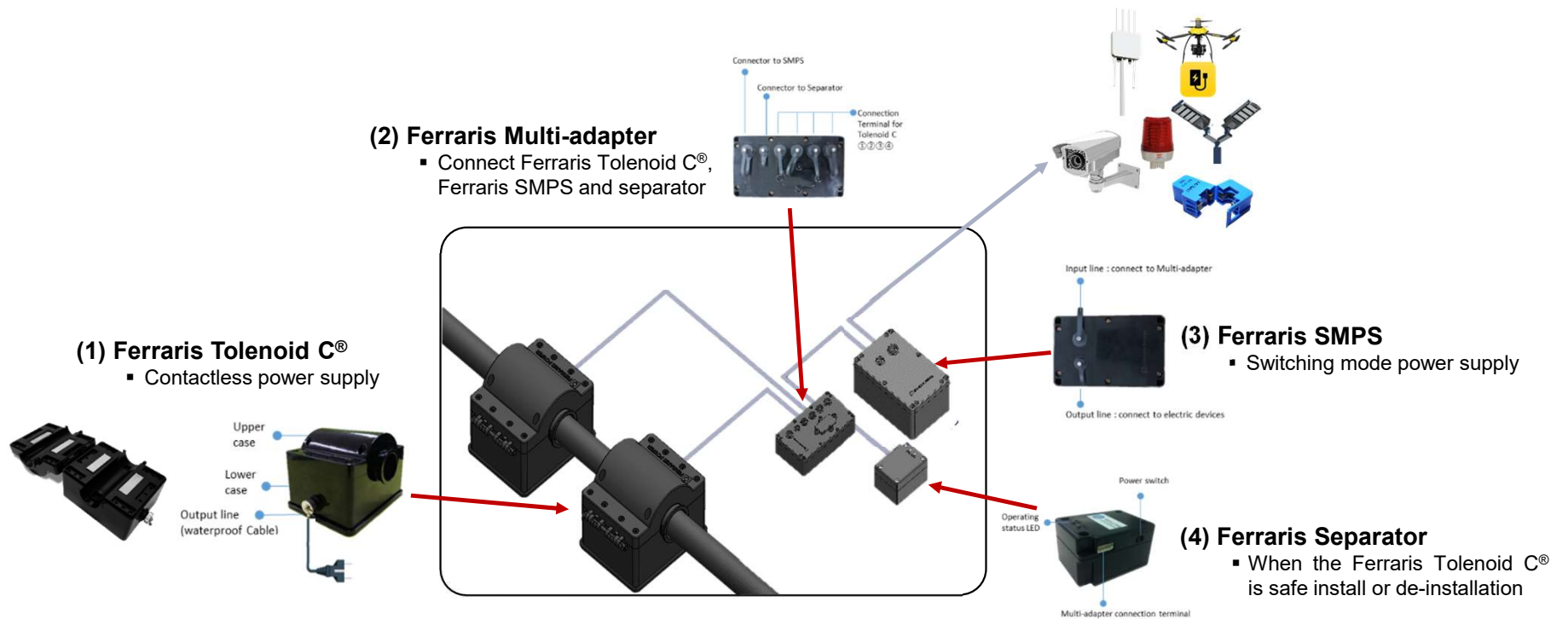
A Ferraris technology which harnesses induced electrical energy from the magnetic energy variation produced from the power line regardless of the power line voltage. The world's first technology that only Ferraris has – Linear power scalability (<https://youtu.be/Y3lR5djt5hg>), input/output power Variation controllability (<https://youtu.be/z3OLe21eFGU>) and Single digit mass production loss ratio.

Ferraris Tolenoid C<sup>®</sup> is designed, developed and manufactured mainly for the electrical power generator.



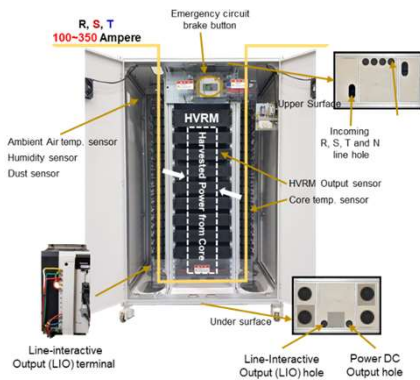
## 2. Ferraris Tolenoid C®

For further information of the Tolenoid C® products, refer to “Introducing Ferraris Tolenoid C®” report.



### 3. Ferraris ERR (Energy Recycling Reservoir) System

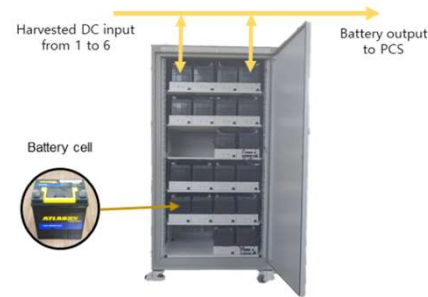
We proudly introduce world's first and only Ferraris ERR System. **The Ferraris ERR System is decentralized power generator.** Ferraris providing a revolutionary paradigm of efficient electric power generation by using magnetic energy harvesting based on existing power lines via the Ferraris ERR System, which composed of multiple Tolenoid C® for high power (<https://youtu.be/JUoLj0x8qM>) with state of art Linear power scalability technology.



**Ferraris Core/HVRM (High Voltage Regulator Module) System and LIO power**



**Power Control Subsystem**



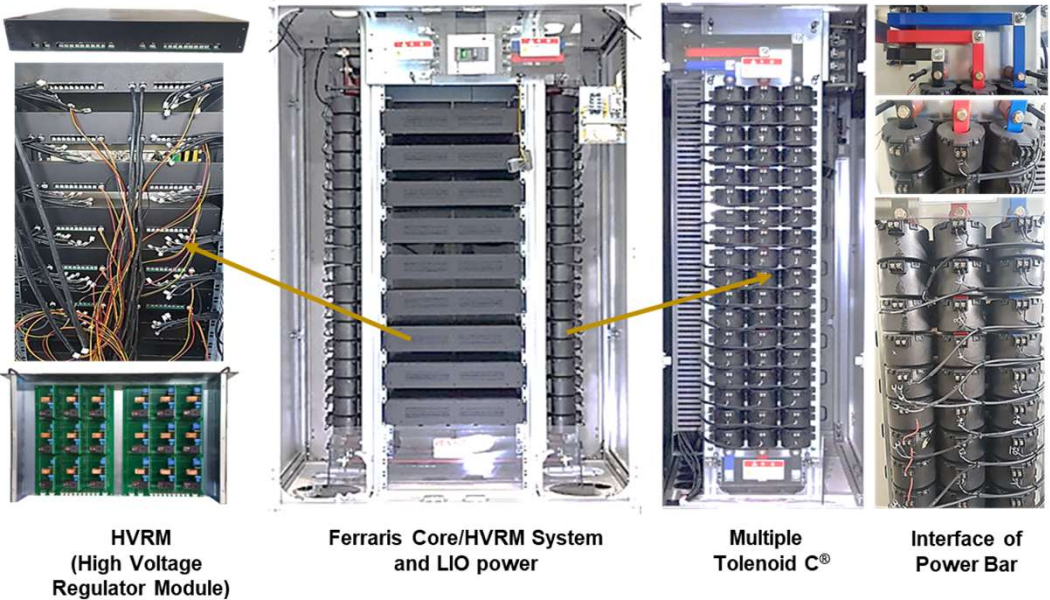
**Battery and BMS Subsystem**



**Remote Monitoring Power and Control system for Multi-site**



Ferraris ERR System is designed to be multiple contactless (Linear power scalability technology) attached to incoming power lines to harness induced electrical energy from magnetic energy variation produced from power lines. The harnessed electrical energy then can be stored in the battery to be used when needed or real-time distributed to the Load, which means magnetic energy harvesting and using power for Load are happened at the same time.



The Ferraris ERR System is normally installed using contactless method on three-phase four-wire power lines (R, S, T and N). Ferraris ERR System can be cascade (serially) and/or Parallel connected and is highly scalable with decentralized installation. This scalable feature enables customer decide electric power capacity of Ferraris ERR System depending on the environment and customer requirement easily.

Under assumption that Ferraris ERR System is installed in 100, 200 or 1,000 different buildings, sudden power outages or shortages arising from emergency situations, the Ferraris ERR System can be used to provide steady electrical energy to power the building's load. This could potentially be used to save lives by providing alternative to medical facility's backup generators as the network of buildings (**InterBuilding Power Energy Network**, where Building-to-Building power energy share) using Ferraris ERR System can support such facilities in the direst circumstances.

This is a simple example of Ferraris ERR System's future use, and Ferraris envisions further application of its Ferraris ERR System beyond interBuilding power energy network to an **InterCity Power Energy Network**, where City-to-City power energy share where a stable emergency power can be provided to the most critical electric infrastructures such as hospitals in state of emergency.

Potential power backup system feature in case of main power outages.

Ferraris have developed Ferraris ERR System with remote monitoring power and control systems that can simultaneously operate on more 1,000 different sites.

For example, the high power lines, such as commercial building, server operating company, EV charging station (level 3 charging), markets (Whole foods market, Costco, VONS, Ralphs etc.), cold storage, frozen foods storage, factories, solar farm, wind farm and more potential customers can be easily used to harness the magnetic energy constantly from their existing power distribution lines without upgrading power source. [https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive\\_en?redir=1](https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en?redir=1)

Therefore through Ferraris ERR System, customers can vastly improve electric energy usage efficiency, such as reducing reactive power and improving power factor and so on, ultimately reducing costs from power consumptions over the long run.

For further information of the products, refer to “Introducing Ferraris ERR System” report.

## 4. Estimated electricity production by Ferraris ERR System

For further information of the case 1 to 7 configuration, refer to “Introduction to Ferraris ERR System” report.

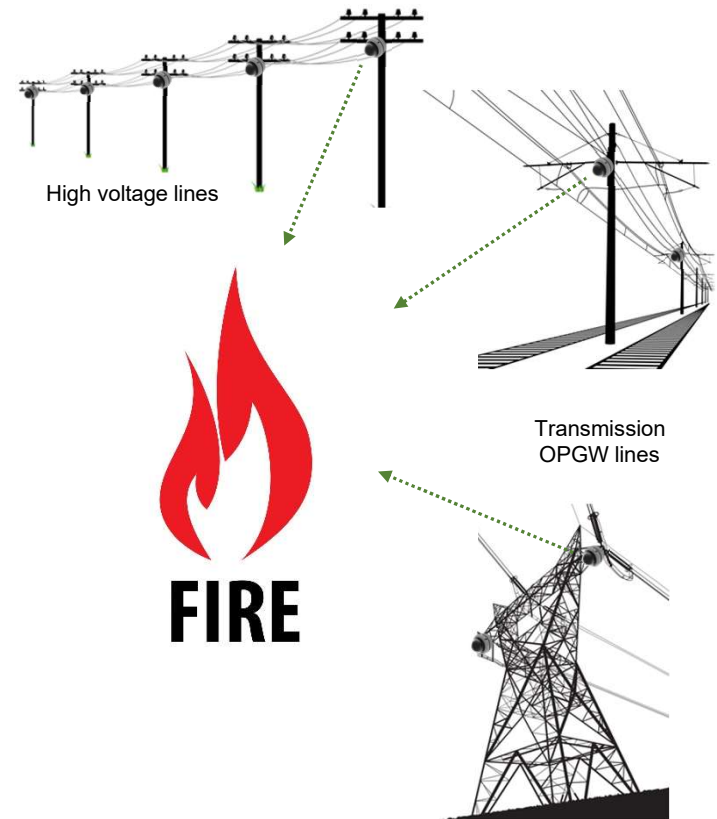
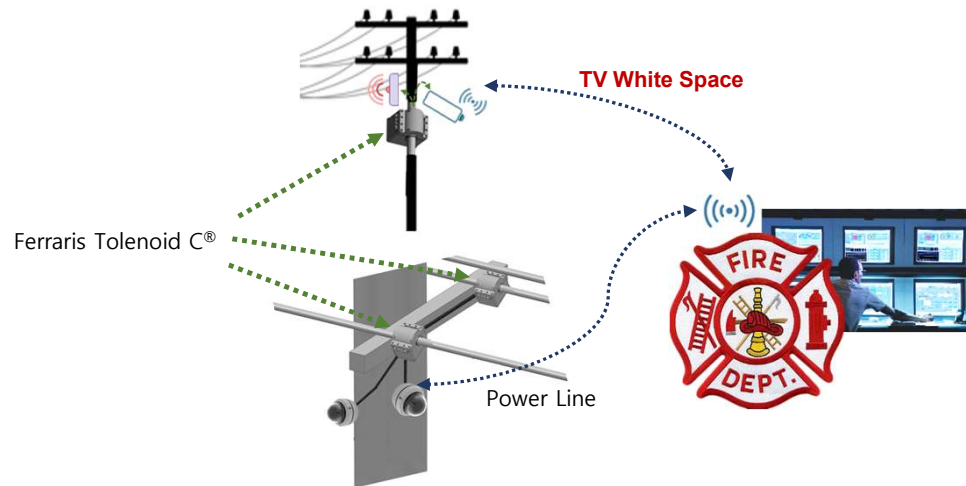
Case	Configuration of Ferraris ERR System	R, S, T Line Current (Ampere)	Using R, S, T Line	Using Ferraris Core/HVRM system (20kWh)	Supply power to the Load	Supply power (kWh/each the Load)	Total supply power
1	Basic	100~350	1	1	1	20	<b>20 kWh</b>
2	Cascade	100~350	1	3	3	20	<b>60 kWh</b>
3	Cascade	100~350	1	3	1	60	<b>60 kWh</b>
4	Cascade	100~350	4	12	4	60	<b>240 kWh</b>
5	Parallel	200~600	1 (line split)	2	1	40	<b>40 kWh</b>
6	Parallel & Cascade	200~600	1 (line split)	6	1	120	<b>120 kWh</b>
7	Parallel & Cascade	200~600	4 (line split)	24	4	120	<b>480 kWh</b>

## **II. Power application using the Ferraris Tolenoid C<sup>®</sup>** **(Power supply solution for Above / Underground)**

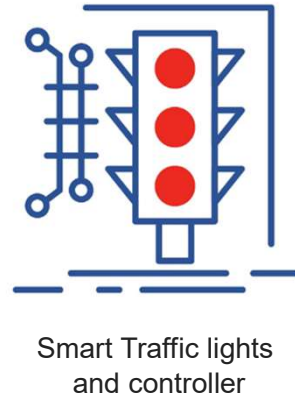
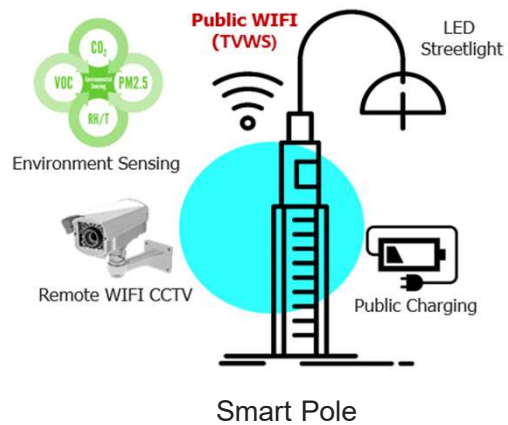
# 1. Wildfire early warning system on Power pylons without transformers

Ferraris solutions can provide electric power to remote devices anywhere power lines can be found. The contactless power supply (Tolenoid C<sup>®</sup>) can be installed on existing high voltage lines, transmission OPGW (Optical Glass Wire) line and provide power to various devices.

Devices such as CCTVs, Fire sensors, Lighting sensors, TV white space wireless devices and more can be setup using Ferraris Tolenoid C<sup>®</sup> to form an early warning system against Wildfires.



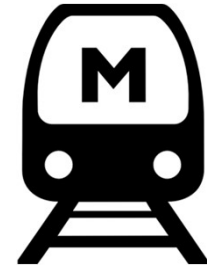
## 2. Above ground for Smart cities



## 3. Underground for Smart cities

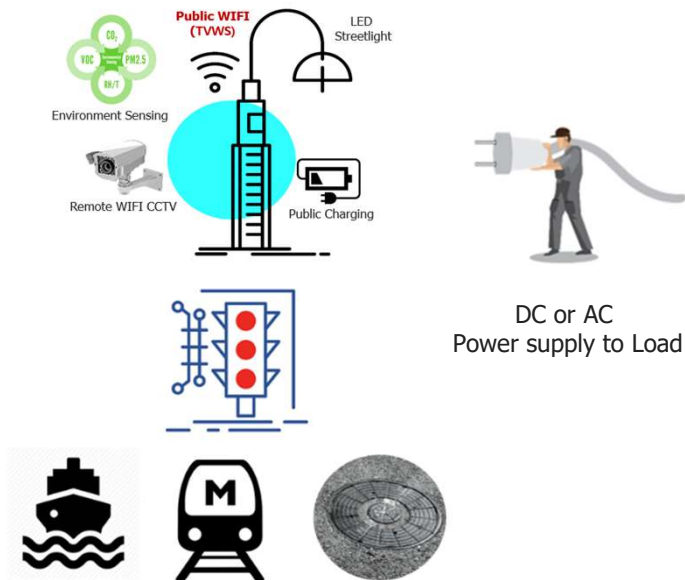


Electric IoT sensor,  
Manhole fault detection system  
(w/ TVWS) or  
Partial discharging system  
for underground transmission line zone

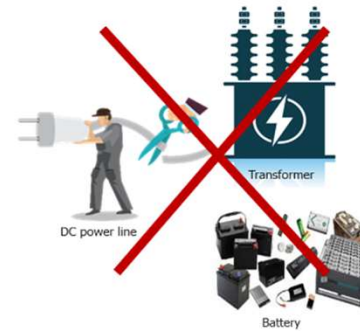


Distribution power line  
monitoring system (w/ TVWS)  
For Train monitoring system

## 4. Contactless power supply solution (Tolenoid C<sup>®</sup>) for IoT and Smart cities



Ferraris Tolenoid C<sup>®</sup>



### Key obstacles of current power supply

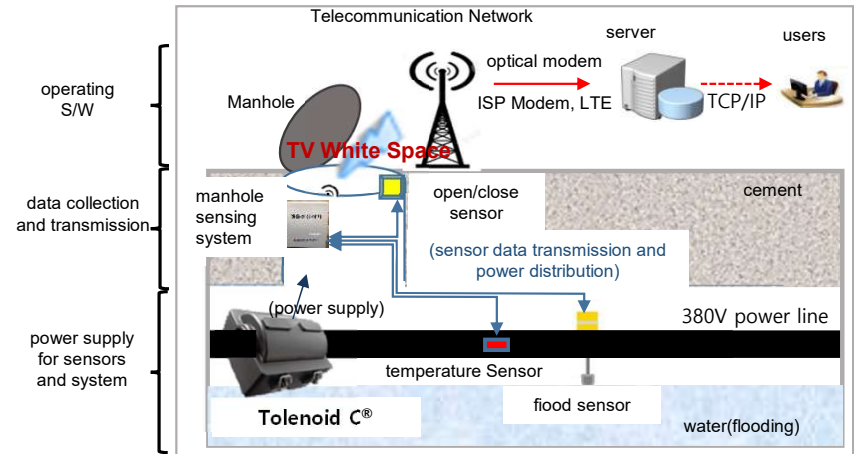
- A Huge investment in the usage of electric power line via transformer is required
- Long construction period, sometimes couple of years
- Continuous investment in operating & maintenance cost



## 5. Manhole status information system

Ferraris smart grid solutions provide electric power to devices anywhere where power lines are, such as distribution line and underground line. The contactless power supply device (Tolenoid C<sup>®</sup>) can be installed on existing high voltage lines and provide required power to various meters, sensors and TV White Space wireless device. (Environmental conditions are considered, such as temp. and water)

With conventional solutions, it is difficult to secure separate conventional power source, such as 110V or 220V) when dealing with underground power lines. Power can be acquired from an underground high voltage power line and used for the power source of various meters and sensors installation.



## 6. Monitoring system for Metro distribution power line

Definition - Firewatch system that monitors changes in temperature in real time on the bridged point of interface power line along the 22.9kV distribution power line of Metro train system.

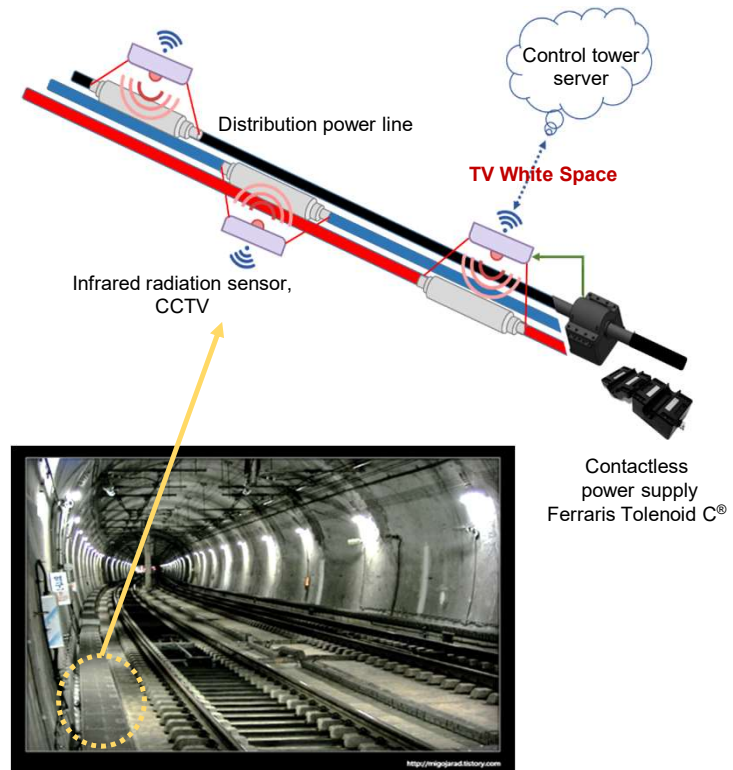
Utilizes Infrared radiation sensor, CCTV, TV White Space wireless device and Ferraris Tolenoid C<sup>®</sup> (contactless power supply - power generator).

Installing Ferraris Tolenoid C<sup>®</sup> provides stable power to the monitoring system for 8 to 10 years, thus reducing battery replacement costs and following labor cost for the battery replacement and hazard material.

Inside distribution power line trough.



Point of interface power line  
(Normally 22.9kV line)



## 7. A reliable & economical broadband service supporting anywhere

Ferraris provides a contactless power supply solutions for system providers who focus on Above ground/Underground IoT, Smart Cities, Smart Farms and Smart Grid. The main hurdle which the system provider and customer faces is transference of real-time data from variety of systems which can be transmitted by efficient and economical Wi-Fi Solution. (for instance, Manhole status information system in an underground, Wildfire early warning system in a thick forest)

We would like to introduce to you an efficient and economical Wi-Fi Solution.

- For the data communication, data range is max. of 10 km above ground and 2 ~ 3 km range underground :
- Super Wi-Fi Technology (Adaptrum TV White Space)

Long Distance. Amazing Penetration

10km NLOS



Reliable wireless broadband service anywhere

Utilizing low-frequency UHF spectrum, Adaptrum radios are able to achieve ten times the coverage of higher frequency WiFi solutions, and provide connectivity in non-line-of-sight (NLOS) conditions to remote communities, across rugged terrain, and through heavy trees and obstacles.



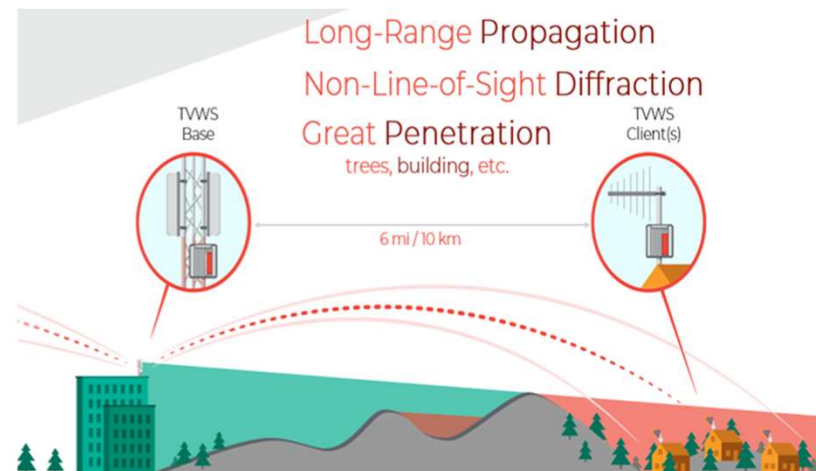
Remote Homes



Hilly Terrain



Heavy Foliage



## 8. High-Voltage Overhead Power Line precision inspection drones

The annual labor cost of Overhead Power Line (OPL) inspection in eight major countries is estimated to total around USD 250 BIL (US, Canada, Brazil, Italy, India, China, Japan, and South Korea). Furthermore, there are many recorded accidents fatalities during OPL inspections.

66.3% of OPL cannot be maintained manually, and 83% of open circuit faults occur at 154 kV. The usual OPL inspection method is through ground check, robot and camera drone which can cover around 5 ~ 6.5 km in a single day.



- OPL damage  
damper detached, cut, pinch. insulator damage & crack, imbalance, foreign material, clamping detached, swelling, clamp overheat

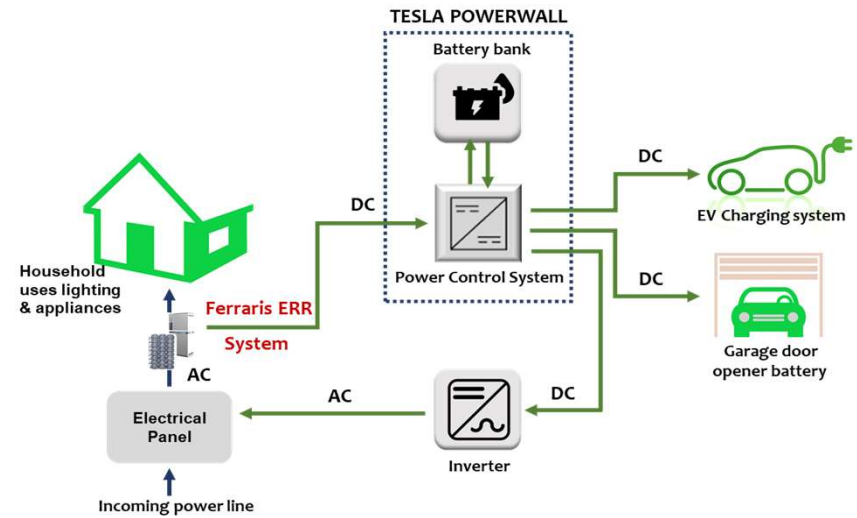
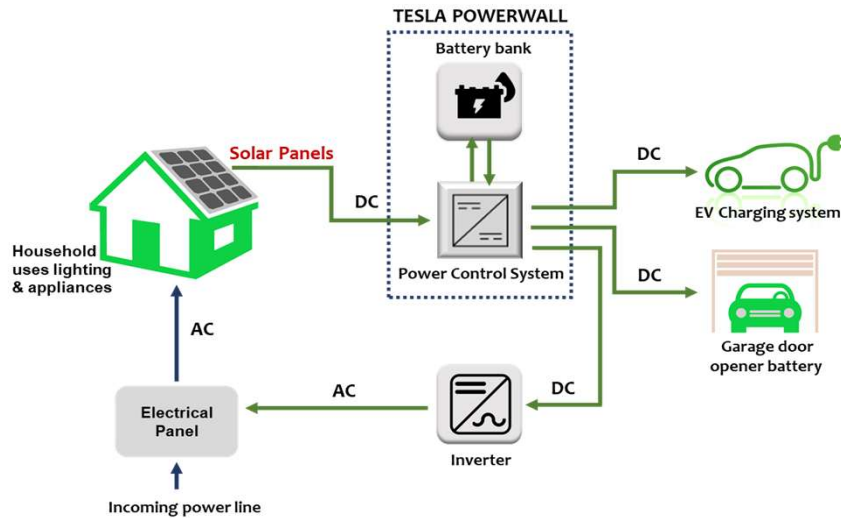
By using Inspection drone, a product integrating the next generation technology from SAFEUSDRONES and Ferraris Tolenoid C<sup>®</sup>, you can dramatically reduce the time, cost, and hazards in OPL Inspections.

- Operating on high voltage OPL without any risk of short-circuit and damage
- Insulation to protect drone against high voltage electricity & shielding against magnetic field
- Inspection operating hours extended (over 30 km per day) through Ferraris energy harvesting module
- Closed-up inspection of inside and outside of OPL, precision inspection with optical, X-ray, fiber optic cameras
- Point marking / cleansing / anti-icing / coating to extend power line lifecycle
- Big data collection



### **III. Power application using the Ferraris ERR System**

# 1. Does solar panels costs justify its benefits?



## 1. Current of Home into a self-powered (using solar panels)

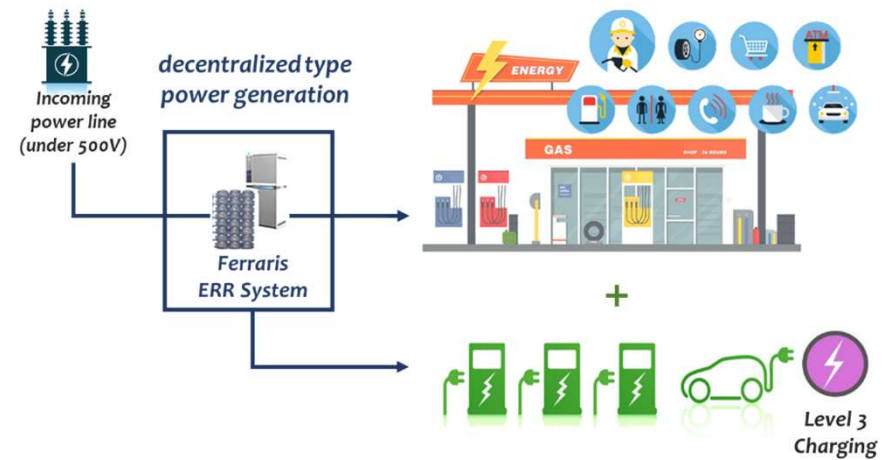
- A typical solution to generate clean energy in a normal household is to install solar panels.
- Is installing cumbersome solar panels on your beautiful house roof really the best solution ?
- Have you ever thought that the solar panels could potentially damage the valuation of your property ?
- What if, you were able to keep your property's aesthetics and still use Tesla's Home clean energy solution ?

## 2. In the future configuration (without solar panels)

- With Ferraris ERR System (for Home edition), you are able to achieve really clean energy without damaging the aesthetics of your home with solar panels. In short, by replacing solar panels with Ferraris ERR System, you will be able to continue using Tesla Powerwall home system without the need for installing solar panels on your house roof and even more.
- Ferraris ERR System can generate electricity for 24 hours a day and charge the Home Battery as long as main power line is active, and the excess power can be used by the household.



## 2. EV Charging station (Level 3 Charging)



### 1. Current EV Charging station

- Current EV Charging station can not support Level 3 charging without changing Incoming power line method.
- Level 1 Charging - Up to 2 miles, 30 minutes
- Level 2 Charging - Up to 10 miles, 30 minutes

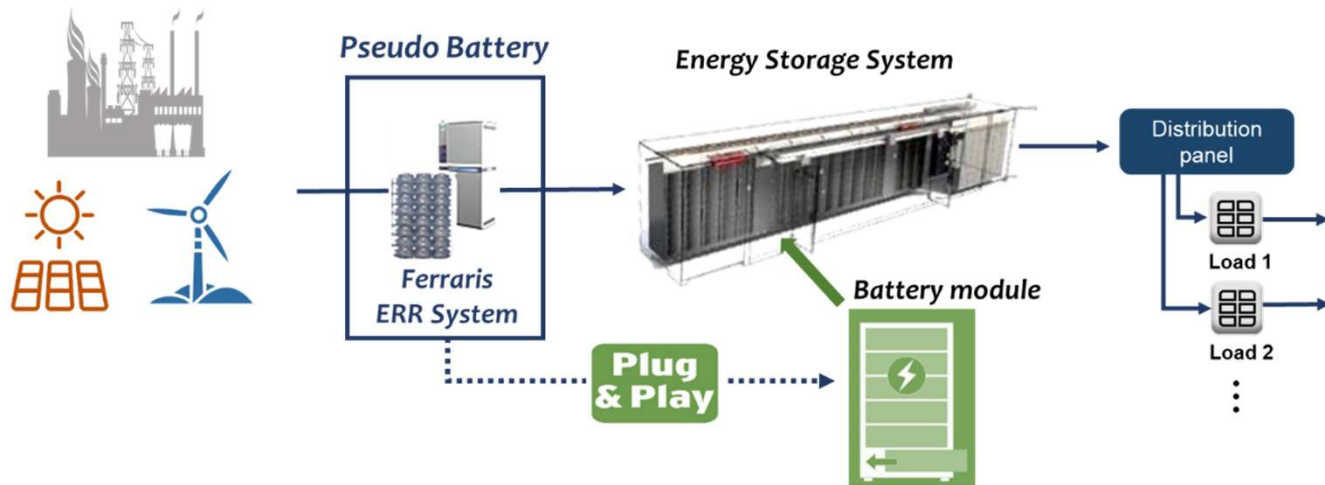
### 2. In the future, EV can recharging *Anywhere*

- Currently, Gas station using electricity for customer service.
- Ferraris ERR System make Gas station possible to support **Level 3 charging.**
- DC Fast/Level 3 Charging - Up to 90 miles, 30 minutes



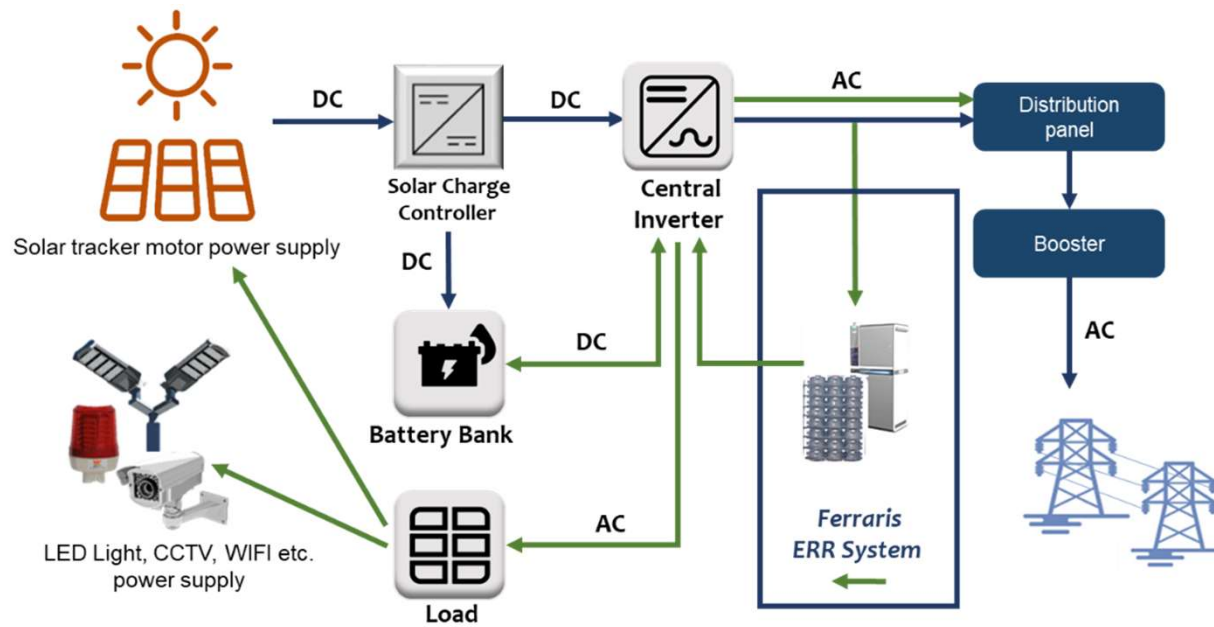
### 3. Pseudo battery for Energy storage system

Replacing defective batteries, without interruption of the power. Make possible preventive and predictive maintenance for ESS battery module management.



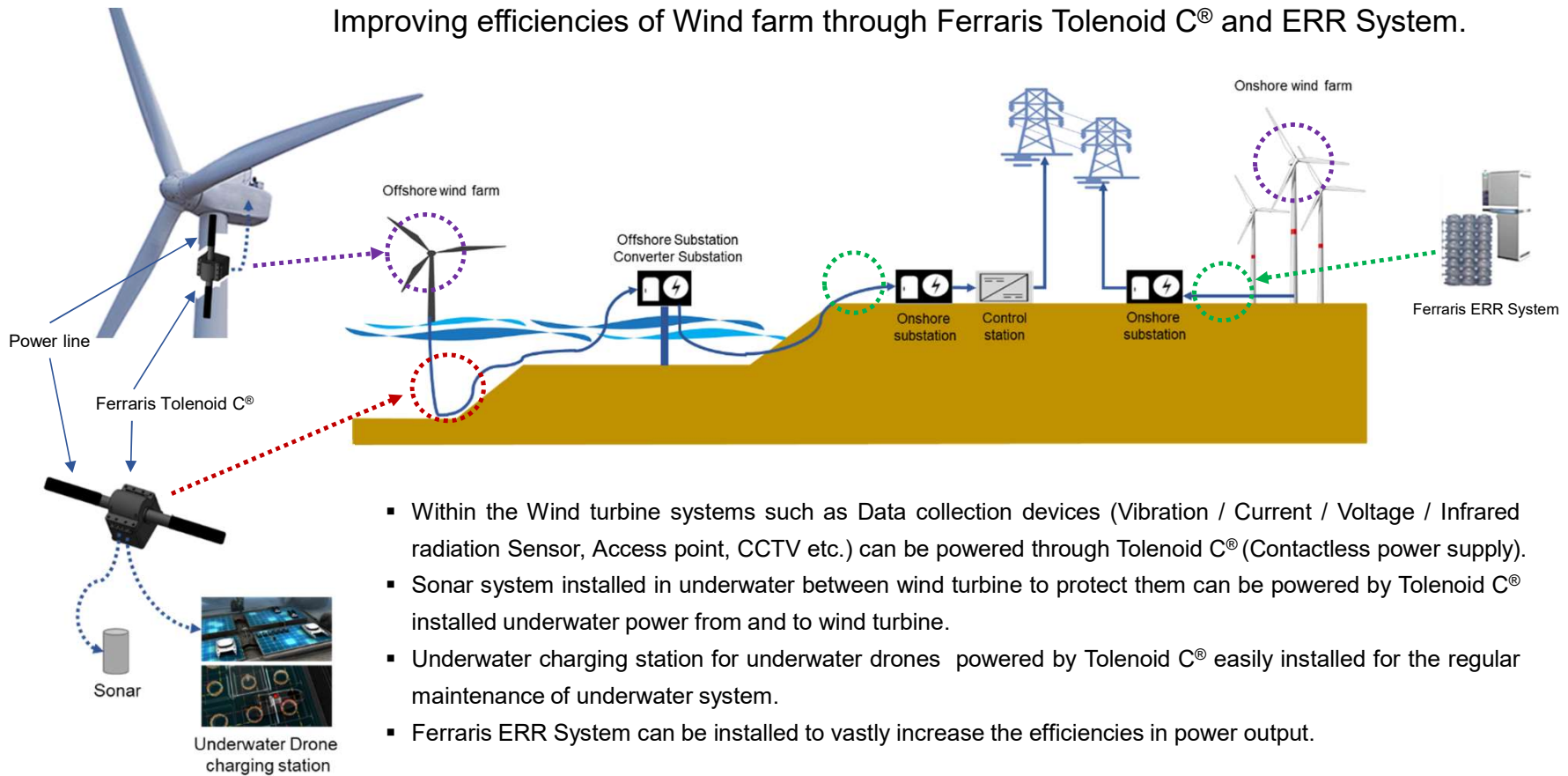
## 4. Solar farm

Improving efficiencies of Solar farm through Ferraris ERR System.



## 5. Onshore/Offshore Wind farm

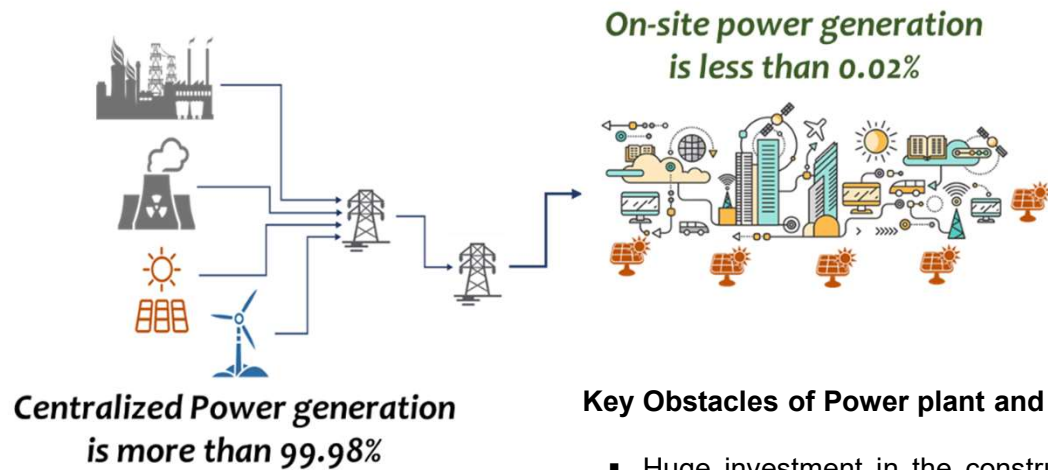
Improving efficiencies of Wind farm through Ferraris Tolenoid C<sup>®</sup> and ERR System.



- Within the Wind turbine systems such as Data collection devices (Vibration / Current / Voltage / Infrared radiation Sensor, Access point, CCTV etc.) can be powered through Tolenoid C<sup>®</sup> (Contactless power supply).
- Sonar system installed in underwater between wind turbine to protect them can be powered by Tolenoid C<sup>®</sup> installed underwater power from and to wind turbine.
- Underwater charging station for underwater drones powered by Tolenoid C<sup>®</sup> easily installed for the regular maintenance of underwater system.
- Ferraris ERR System can be installed to vastly increase the efficiencies in power output.

## 6. Decentralized power generation solution for Smart cities

### 1. Current electric power generation for Smart cities

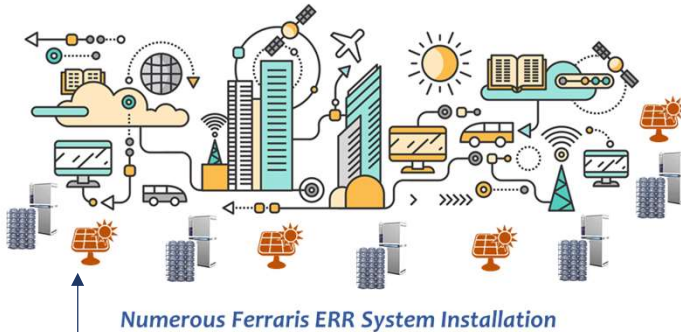


#### Key Obstacles of Power plant and Grid

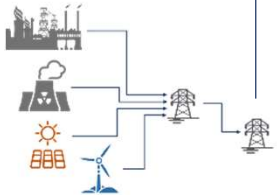
- Huge investment in the construction of Power plants, Transmission tower and Grid system
- Construction period is 2 to 9 years or longer
- Continuous resource and water supply
- Continuous investment in O&M cost

## 2. Future electric power generation for Smart cities

*Decentralized power generation to be more than 25%*



*Numerous Ferraris ERR System Installation*



**Centralized Power generation  
to be less than 75%**

Ferraris value lies in providing Ferraris ERR System solutions for customers with needs as listed below.

- Seeking electric energy saving due to new governmental regulations and policy.
- No Environmental Pollution.
- Reduce the huge investment expenditure.
- Economical O&M cost.
- Resources that will be required is Only incoming power lines in the building.
- When seeking for electric power generating and cost reduction (typically in Residential, Commercial, Industrial and Transportation sector).
- Shorten construction period (1~2 months/site).

## **IV. CEO Biography**

## **JA-IL KOO Ph.D.**

Over 30 years as an electric & electronics system engineer working in the following product areas : medical imaging system, analog/digital circuit design, electromagnetic power harvesting, ASIC System design and FDA & ISO compliance, etc.

Developed and filed more than 12 patents, including medical ultrasound signal processing, semiconductor graphics memory system, magnetic core process for power generation, line transfer system for separate sensor CT and power CT, security camera system and DRONE system powered by contactless magnetic induction method, linearly controllable magnetic core based power supply and so on.

Conducted more than 10 consulting on Korean government smart grid project and underground partial discharge projects and high-power line PLC project and Involved several Korea military submarine projects.

- KAIST(Korea Advanced Institute of Science and Technology), M.S. and Ph.D. in electrical engineering
- Advanced Technical Marketing, Inc., Seattle WA – VP of technology
- Samsung Semiconductor, San Jose CA – Senior staff, product planning for memory system
- VLSI Technology (Subsidiary of Phillips), Phoenix, AZ – Staff engineer on ASIC chipsets
- Siemens Medical System, Issaquah WA – Staff systems engineer, Medical diagnostic equipment
- Associate Professor, Seattle WA – Dept. of electrical engineering, University of Washington



***Electric energy is Electromagnetic energy,  
Our approach to a new paradigm of efficient electric power  
generation and recycling !***

*If there are any questions, please feel free to contact us as below,*

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