

# Company Profile



## Head office

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25,MTV 26-ro 58beon-gil, Siheungsi, Gyeonggi do, 15118,  
Korea

## JV

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1 North Johnston Ave #208, Hamilton Township, NJ 08609,  
U.S.

## Homepage

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[www.sateng.co.kr](http://www.sateng.co.kr)

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# 1.1 Field of Business

## 1. Company summary



<b>Company name</b>	SATENG
<b>Foundation</b>	2003
<b>Technical field</b>	ESS, Renewable Energy, Micro-grid, VPP, Battery Material



**Energy Storage  
System  
(ESS)**



**EPC**



**Battery Material**



**Display Equipment**

SAT, founded in 2003, manufactures and sells Energy Storage System, Renewable energy arrangement, Display equipment and Battery material. Since its flotation on the stock market, SAT has reinforced investment in eco-friendly and renewable energy. Based on proven technology and wide experience, SAT has developed an excellent reputation not only in Korea, but globally across the world.

## 1.2 Organization Chart

### 1. Company summary



**Energy  
Department**



**Equipment  
Department**

**Energy Storage  
System  
(ESS)**

**EPC**

**Battery Material**

**Display  
Equipment**

**Semiconductor  
Equipment**



**Head office**

Siheung-si, Gyeonggi-do

**A joint venture in U.S.**

New Jersey

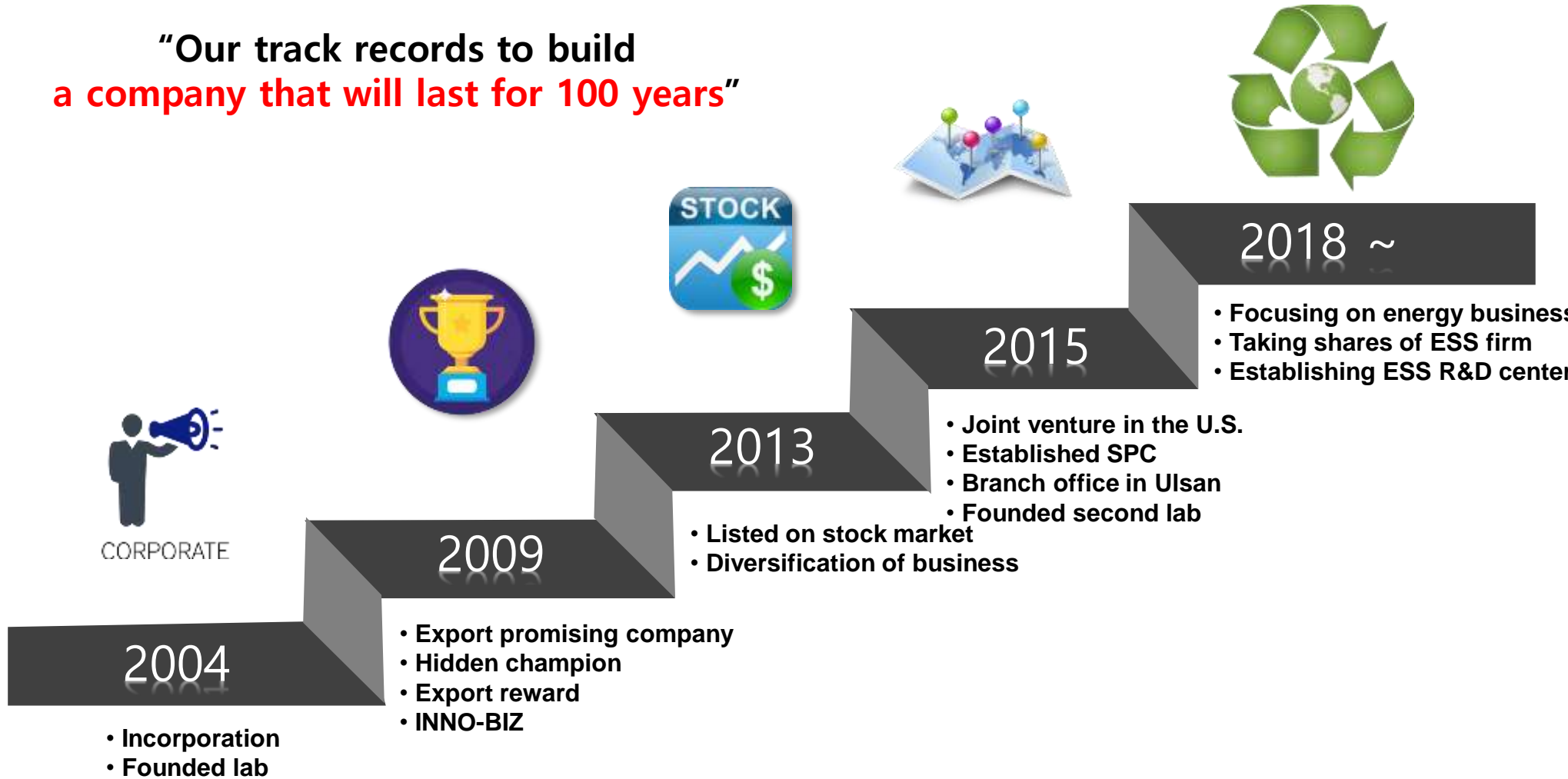
**Battery material lab**

Fine Chemistry complex  
in Ulsan

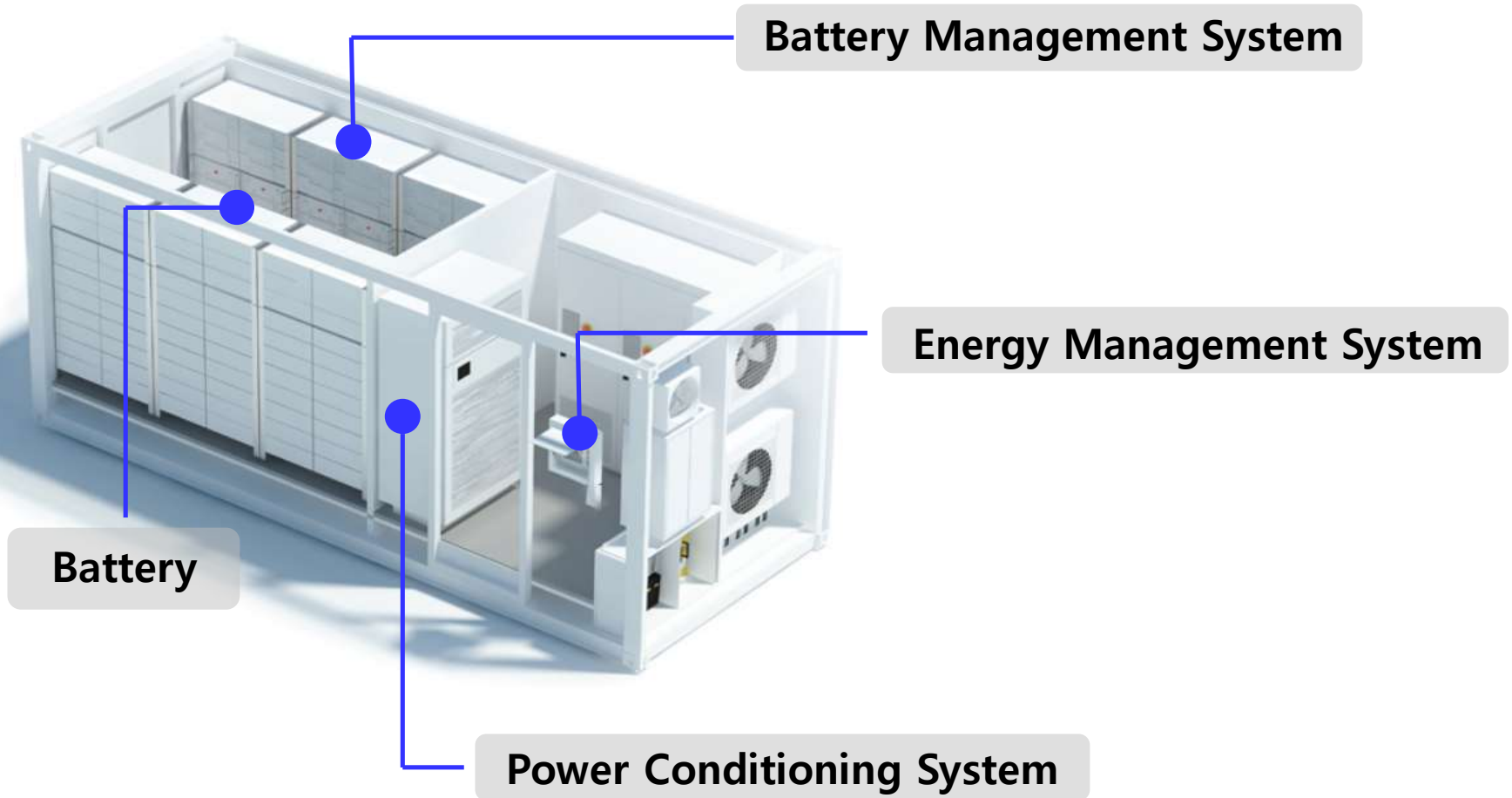
**ESS software R&D office**

Digital complex in Seoul

**“Our track records to build  
a company that will last for 100 years”**



# Energy Storage System



-ESS(Energy Storage System) : Energy Storage system is the set of methods and technologies used to store electricity which is being consistently produced to meet consumer demand.



**Battery for  
Home and Building**

=



**Battery for  
Electric Devices**



**Small Size ESS  
(Residential/Commercial ESS)**



**Large Size ESS  
(Commercial/MW ESS)**

#### ▪ Issues with Existing Electricity Grid System



##### Inefficiency

- About 60% of electricity losses during the power transmission
- Centralized generation and simplex transmission
- Inefficient power supply by passive distribution network



##### Emergency Situation

- Damage and Loss due to power outage
- Safety problems related to medical equipment failure, program loss, elevator stoppage



##### Environmental Disaster

- A danger from natural disaster like earthquake or flooding
- Serious damage to human life and eco system



##### Site Limitation & Air Pollution

- Limitation on a construction site for large scale power plant
- Transmission congestion occurred by uneven distribution
- Excessive Co2 emission & Serious air pollution



### ▪ ESS Solutions



#### Electricity Bill Reduction

- Reduction of electricity charges by lowering the peak power
- Storing energy when the electrical cost is low, discharging energy when it is high



#### Renewable Energy Integration

- A booming trend of expanding renewable energy
- Unstable power supply caused by specific situations like climate change
- Improved power quality by using ESS



#### Emergency Backup

- Stable power supply in an emergency situation
- Backup power during power outage
- Replacement of existing emergency power like UPS(Uninterrupted Power Supply)



#### Power Supply Management

- Charging during high supply and discharging during high demand -> efficient balance between supply and demand
- Power quality improvement by FR (frequency regulation)

### First-Mover in Advanced Market

- SAT set up a joint venture(JV) with AFM in the U.S., which is the first company specializing in distributed FR.
- SAT entered PJM which is the largest FR market in the U.S..
- SAT has accomplished various ESS development business models , cooperating with largest electric utility companies such as PSEG, FirstEnergy and PEPCO in New Jersey, Ohio, Maryland and Delaware.
- SAT gained the opportunity to expand it's ESS business into the huge market, the U.S.by conducting the pilot projects successfully.



Collaboration  
with major electric companies  
in the U.S



PJM - Largest FR market in U.S

#### Full Experience

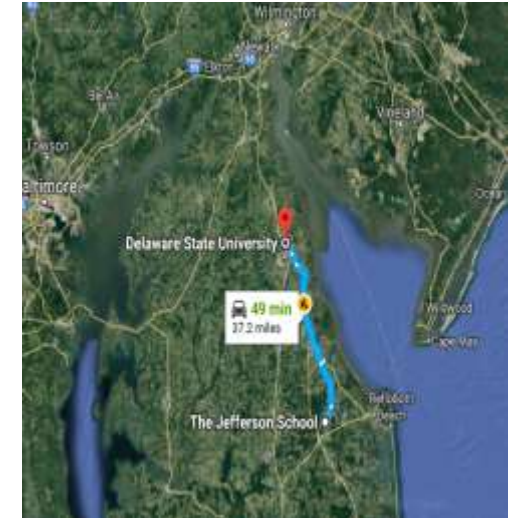
- SAT has wide experience in installing ESS integrated with renewable energies such as PV and wind turbine.
- The sites we have installed are houses and buildings where major companies have invested in and installed renewable energy and are likely to install ESS to generate more revenue.
- SAT has extensive experience from residential capacity to MW scale in ESS industry.
- SAT has accumulated experience not only in engineering, but widely in constructing, installing and O&M. - EPC



**ESS connected to Renewable Energy**  
(PV and wind power)



**from residential capacity to**  
**MW scale**



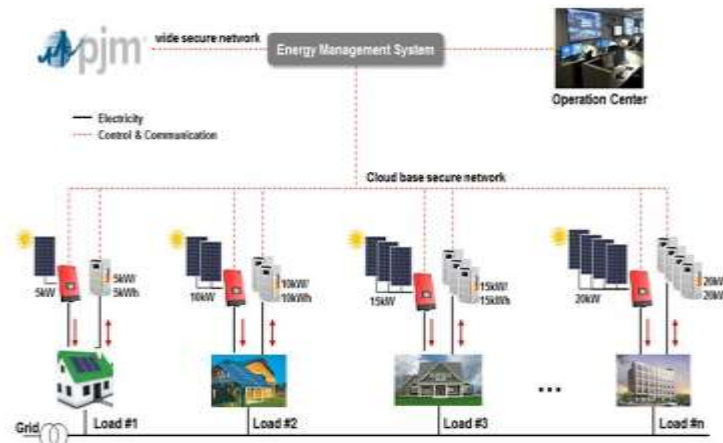
**EPC**  
(Delaware state government PJT)

### Success in the World's First VPP Pilot Project

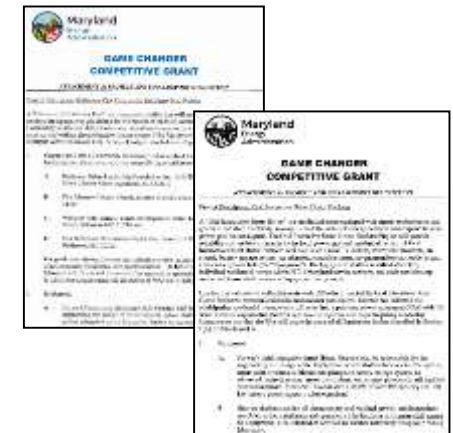
- The world's first residential level Frequency Regulation (FR) VPP pilot project integrating 20 units of 5kW ESS into a 100kW ESS with wireless communication technology.
- After the installation of ESS, the business model has been well proven in U.S., showing excellent performance score:97%
- Our new technology recognized by Maryland State, we acquired 2 government tasks to be able to extend to micro-grid.



ESS for Distributed FR  
in Maryland



Distributed FR ESS Equipment  
& Service Business



New Technology Recognized  
by Maryland State

### Professional Engineers and Technical Skills

- SAT secured professional engineers and technical skills through establishing JV with distributed FR company in the U.S. and taking shares of ESS/Renewable energy company in Korea respectively.
- SAT JV is composed of experienced engineers and developed commercial capacity ESS with the largest electricity company, First Energy.
- Proprietary BMS/EMS Technology – SAT's BMS technology has been verified in the U.S. market for the fastest responding Frequency Regulation/ SAT's EMS technology has been proven by several global companies such as LS, PPS, and Ideal Power.

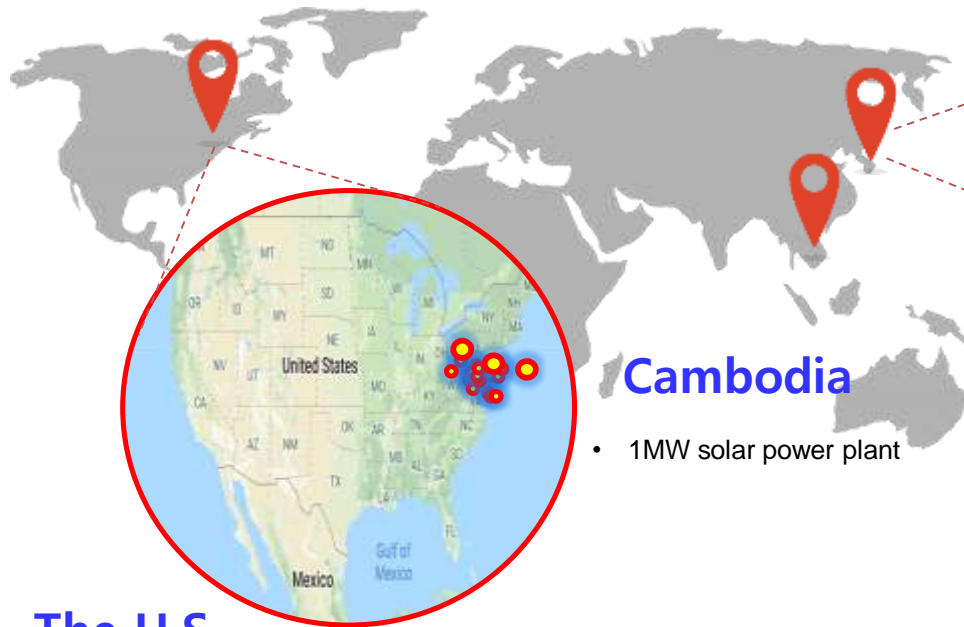


Professional Engineers



SAT EMS UI & SAT BMS



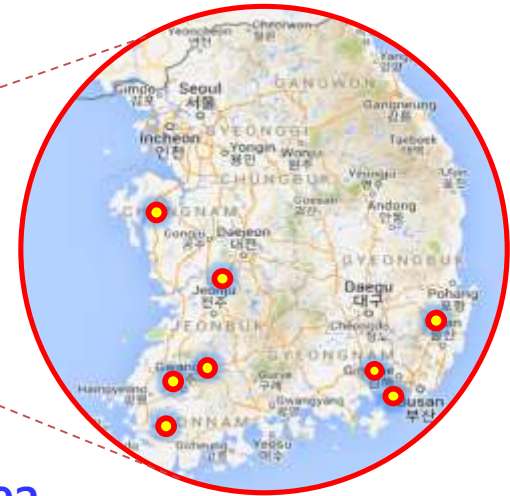


### The U.S.

- VPP pilot project aggregating residential DER of 20 ESS units comes to 100kW to bid into PJM FR market in Maryland.
- Installed a wind power integrated 100kW ESS for developing with CWRU in Ohio.
- DER ESS units comes to 500kW to bid into PJM FR in Delaware. (University of Delaware, The Jefferson school)
- The world's first commercially proving the aggregating DER of 5 units comes to 100kW to bid into PJM FR market in Ohio.

### Cambodia

- 1MW solar power plant



### Korea

- 1.8MW solar power plant in Andong
- 1MW solar power plant in Jangseong
- Construction of SG station at the head office of KEPCO(Korea Electric Power Corporation) in Naju
- Set up ESS on the site of Humansia APT in Yongin
- Installed ESS integrated to PV in Hyundai Hymys
- Installation of ESS for LG MMA
- Installation of ESS for Donyang industry
- Installation of FEMS+ESS for Powell
- Constructed solar power plants for Prime, Onegene, Songhyun
- Participated in the regional activation business – 6 sites in Naju industrial complex

# Battery Material

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## 2.5 Battery material

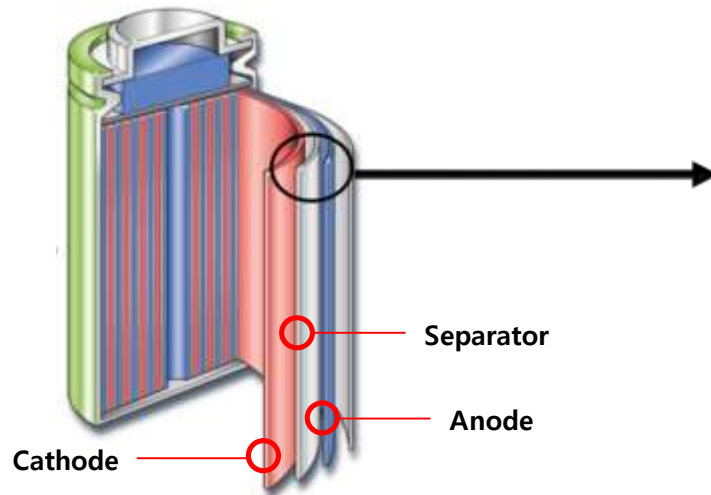
### 2. Introduction of business



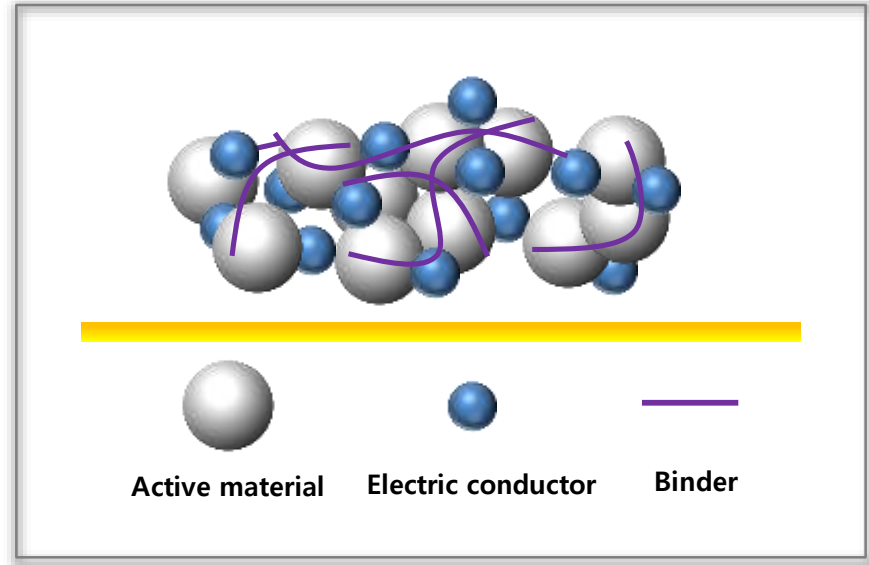
- SAT has developed battery materials cooperating with UNIST, Ulsan university and research institute.
- Several companies in German and Japan have monopolized the binder market.
- Our goal is to develop high quality of battery materials and provide it to our customers with reasonable price.
- Our R&D center is located in Ulsan industrial complex (Ulsan fine chemical industry center).
- SAT has already secured a site to mass-produce battery materials.



#### - Binder



**Lithium Battery**



**Binder**

- Lithium battery consists of Cathode, Anode, Separator and Electrolyte.
- We develop and produce high polymer additives which are mixed to binder and electrolyte substances.
- The polymer material functions as some glue to keep active material and electric conductor all together and cover the plates of battery.
- Using small amount of strong adhesive binder contributes to improving total quality of battery
- We expect that the needs of our product would be increased considerably because the green energy industry seems to grow up continuously in the future.

#### - Additives



**Flexible battery**



**Wearable device**

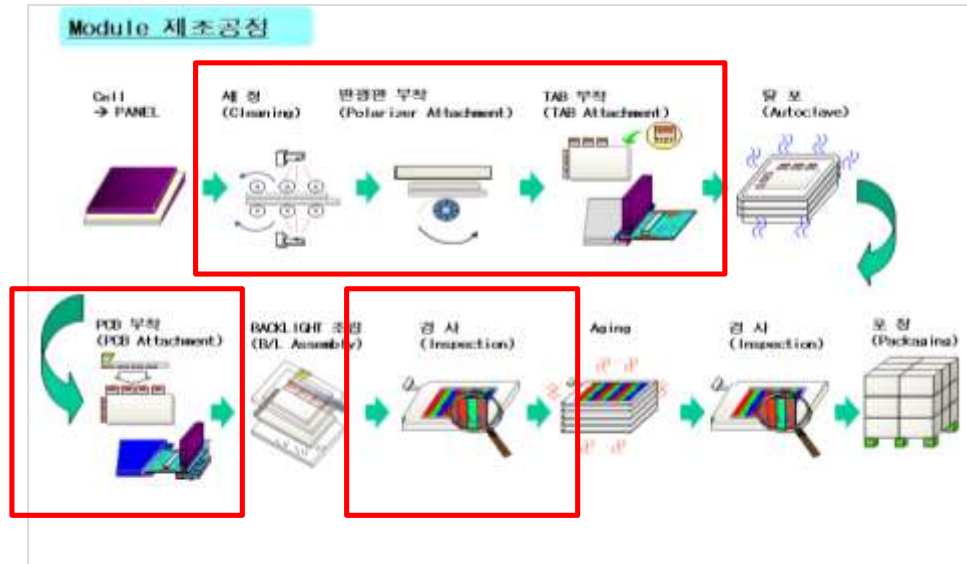
- We also produce additives which are used to make electrolyte into gel type substance. It is specialized to be added to transforming products such as flexible batteries and wearable devices.
- When the flexible batteries and wearable devices are widely used, the demand for additives making electrolyte into gel type substance would rise sharply.
- SAT acquired a patent for gelation polymer material in 2017

# Display Equipment



## 2.6 Display equipment

### 2. Introduction of business



Business field in display equipment



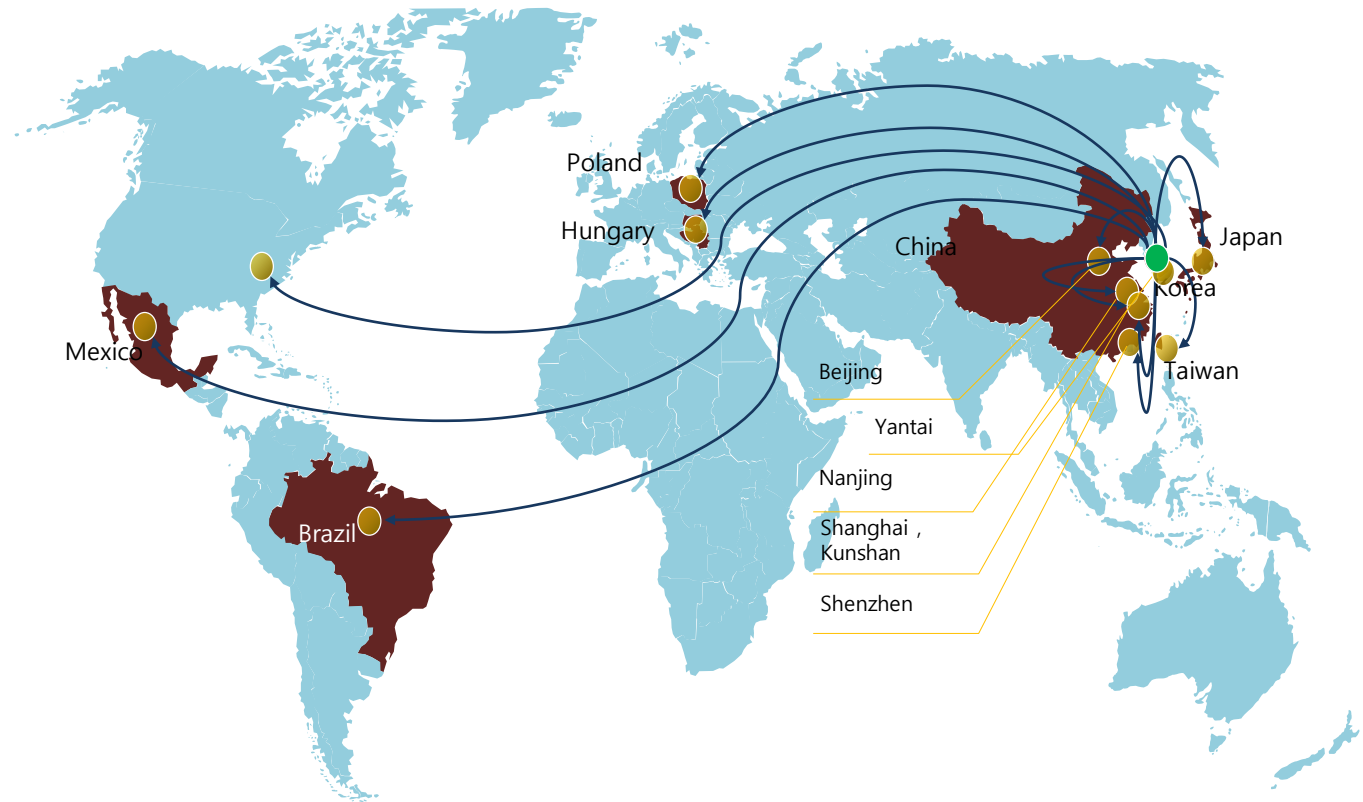
Bonding system & Inspection system

- SAT develops and manufactures FPD Bonding System, Inspection System to produce display panels like LCD, OLED, Flexible OLED, LED, etc..
- To manufacture display module, the panel should go through a series of process including cleaning, attachment, inspection, etc.
- Our customers are not only in Asia countries like China and Japan, but also distributed widely throughout the world, including Europe, North America and South America.

## 2.6 Display equipment

### 2. Introduction of business

#### Our clients



- Our clients are major display manufacturers, like LG, SAMSUNG, SHARP and so on.
- Based on our extensive experience and networks, SAT would be able to find a larger market in the field of energy.

# LED Lighting

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## 2.7 LED Lighting

### 2. Introduction of business



**SAT LED**



**OUTDOOR LED**

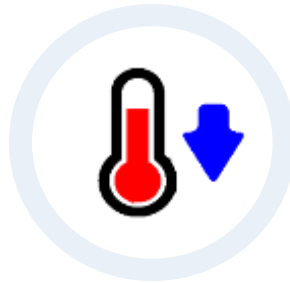
- SAT specializes in producing outdoor LED lighting, which has been enjoying good reputation in superior quality and reasonable price.
- SAT LED is 100% made in Korea, which is very light, also can be produced with minimal costs due to simplifying components and assembling process.
- Too much heat is the #1 killer of LED lights. lack of airflow around the heat sink or poorly regulated mains power supply can be detrimental to the life of a LED. SAT has own heat dissipation technology



**Excellent  
Illumination**



**Lightweight**



**Heat dissipation  
technology**



**Durability**



**Reasonable Price**



**Customized**

- SAT LED has outstanding Luminous Efficiency (110 ~ 150 lm/W) and Heat dissipation technology is applied
- It has well ventilated frame and housing with thin and pleated frame.
- SAT supplies various beam angles (10/20/30/40/50/60/80/100 °), designing LED frame to meet the needs of clients.



## 2.7 LED Lighting

### 2. Introduction of business

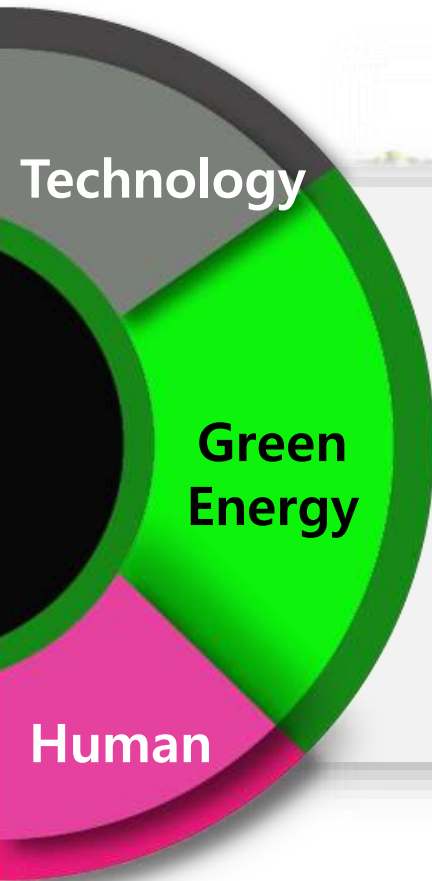
Overseas



Korea

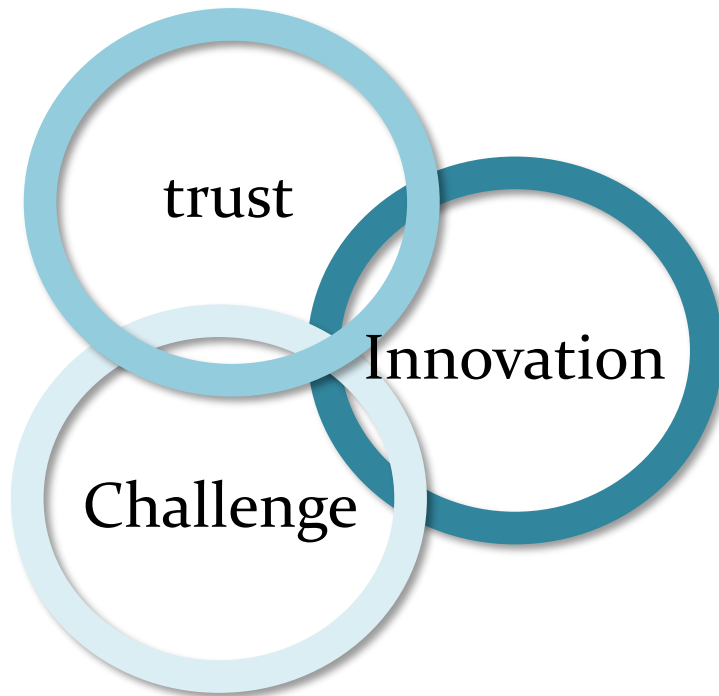


**"The total energy solution company that leads the world market -  
Above SAT"**



- Securing advanced technology by investing in R&D
- Cultivating and discovering people who combine technology and global sense
- Developing and providing green energy products to contribute to environmental protection
- Growing into a global company loved by customers all over the world through corporate branding strategy

Let's go to the future! To the wider world! **Above SAT**



- SAT is ready to welcome new challenges and opportunities.
- SAT considers trust and cooperation with customers as top priority.
- SAT repays customers for their love with the best quality and transparent management.

**Thank you !**