



HATS

Digital Smart Mining Solution



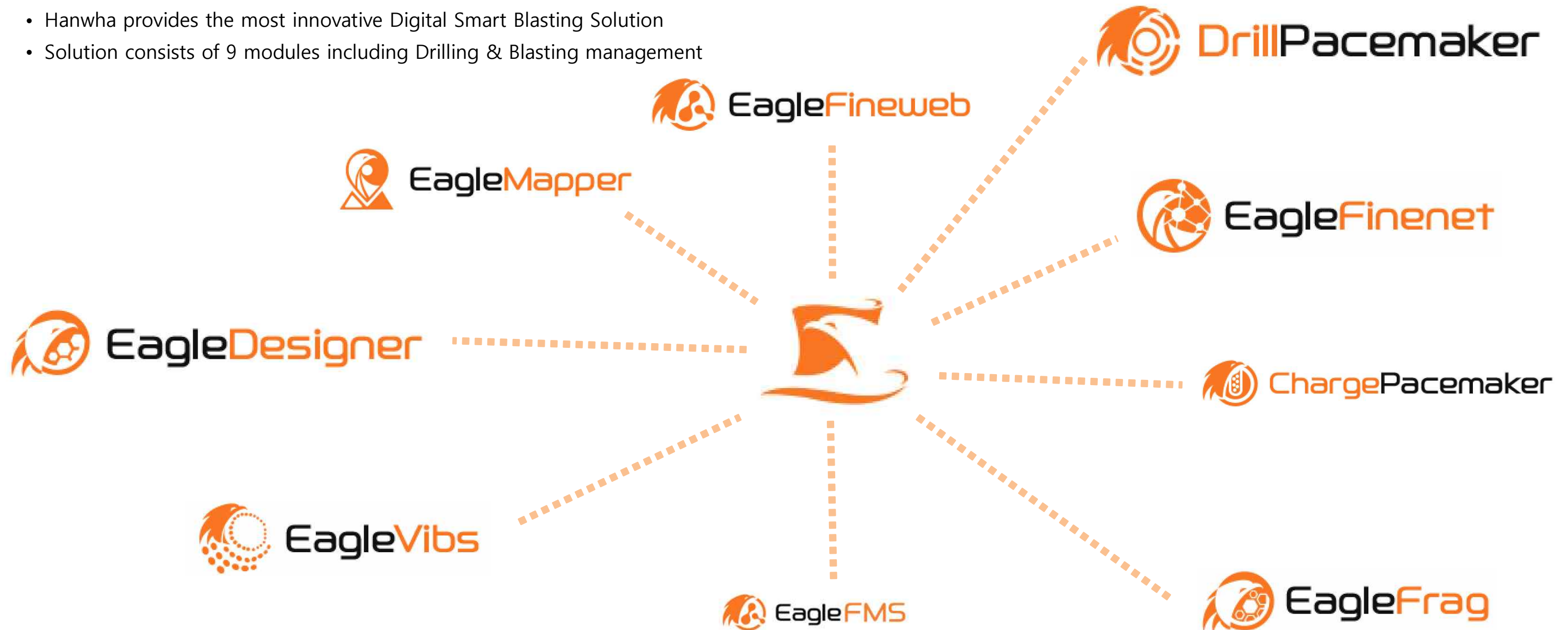
Hanwha Corporation, Innovative & Competitive

Hanwha Corporation has played a crucial role in supporting the nation's economic development for the past sixty years. With our innovative endeavors to improve management efficiency, we have realigned our business operations to focus on the Explosives and Defense Divisions as well as our global expertise-based Trade Division. We successfully completed our merger with Hanwha Tech M (currently Hanwha Corporation/Machinery Division) in October 2014. We also strengthened our position as the nation's largest total defense contractor after launching Hanwha affiliates in the defense sector: Hanwha Techwin and Hanwha Thales in June 2015, and Hanwha Defense in May 2016. This has allowed us to move forward with our vision to be a global top 10 defense industry player. Based on our broad business experience, we have also created new core technologies, sustaining market growth and expansion abroad.



What is HATS?

- Hanwha provides the most innovative Digital Smart Blasting Solution
- Solution consists of 9 modules including Drilling & Blasting management



Innovative Technology

- Real-time monitoring for Safety and Risk assessment (Risk Reduction).
- Precise GPS and Digital sensing for productivity (Cost Reduction).



Cost effective High – tech Network



Versatility

- Commercial Network is available (LTE, 4G/5G, etc.)
- **Build up local network is also possible (LoRa,WiFi, etc.)**

Efficiency

- Lower facility cost than commercial network
- Auto-power supply with Solar power module

Stability

- **Low powered long range network is available**
- Reliability in communication

Eagle Finenet, original network of **HATS**, provides communication infrastructure throughout the mining site regardless of the terrain. Even in an environment where it is difficult to use the existing communication network, it forms local network, providing excellent security against hacking. And stable power supply is possible with a solar module. It guarantees high reliability by combining our patented technology with combining LoRA and WiFi network.



EagleMapper

GPS based 3D modeling Scanner



Accuracy

- Build up **GPS based** actual mapping data
- Improve the accuracy of content management with 3D topography

Tech. Services

- Management of mining site changes
- Management of productivity on working shift

Digital

Mapping

- Cost reduction in analysis with advanced equipment
- Minimize human error

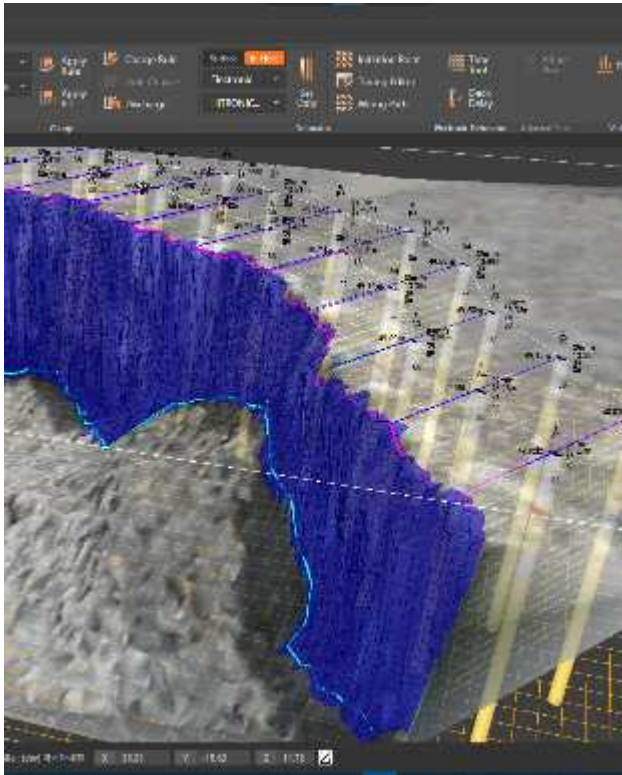
Eagle Mapper, HATS 3D modeling services, offers below advantages.

First, it's able to build a GPS database by digital scanning the actual terrain of the site with drone/LiDAR.

Second, Measuring and modeling actual terrain of the site in 3D, It enables design suitable fore real condition.



3D Smart Blast Design Software



Optimization

blasting

- Optimization of blast pattern by design process.

Differentiated design

- Design based on the **3D modelling**.
- Improve blasting efficiency by using the actual terrain.

Convenience

- Convenient design with one-click process.
- Sharing design data through the web in real time.

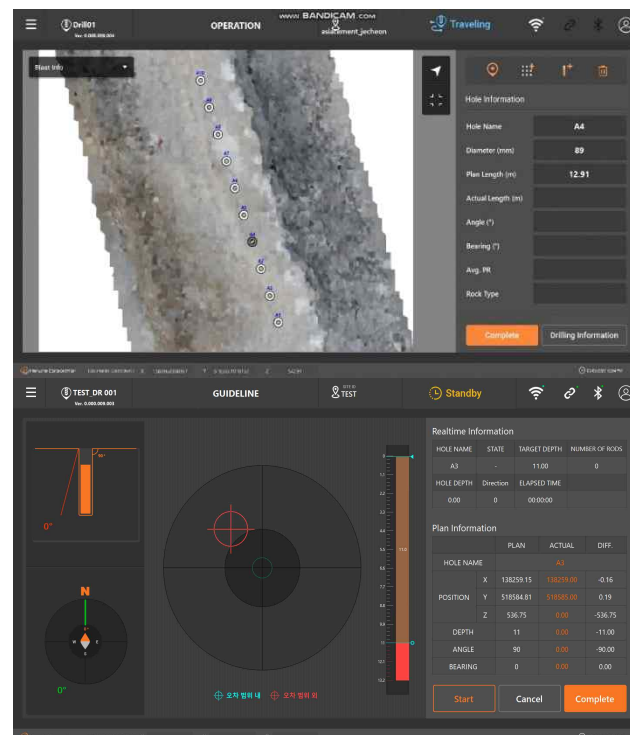
Eagle Designer, Blasting design software of **HATS**, is based on actual terrain modelling. It's very convenient to use for everyone.

The software shares blast pattern through a network(EagleFinenet) in real time.

And it provides the Frag. and vibration predicting function. Also its history analysis can make optimized blasting pattern.



Precise Drill-managing Solution



Precision

- Provide GPS-based local data in detail.
- Guide program for accurate drilling.

Automation

- Automatic gathering data and building database.
- Efficient blasting pattern using rock strength data

Generality

- enable to apply on any drill regardless of manufacturer.

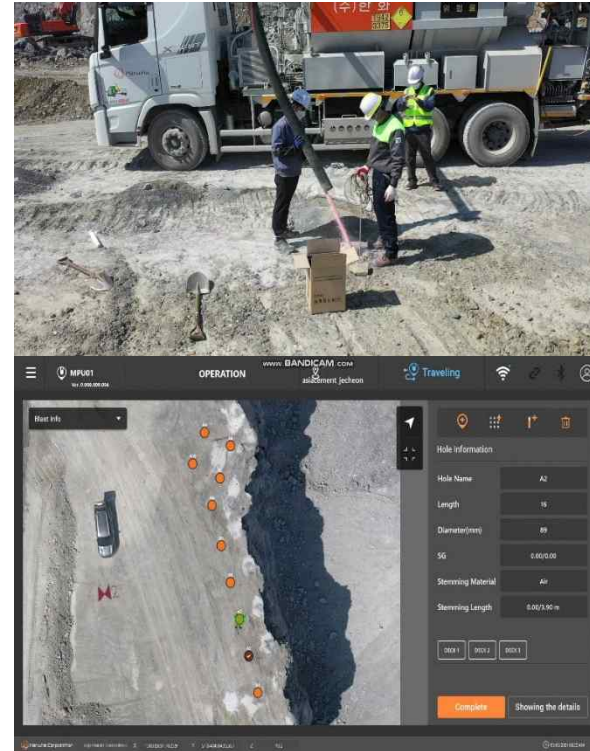
Drill Pacemaker, drill management solution of **HATS**, consists of 'Hole Navigation System' to support accurate drilling.

High-performance GPS and our perforation guide S/W encourage perforation workers to work accurately and monitor the drilling in real time.

Gathering rock information automatically and predicting rock strength for improving the blasting efficiency.

ChargePacemaker

Accurate Charging Management



- Accuracy**
- Guide function for bulk charging.
 - Cost reduction by precise control of charging.

- Automation**
- Automatic gathering and building database.
 - Tracking the amount of charging explosives.

- Optimization**
- Checking P.F according rock density.

ChargePacemaker, Charging management solution of **HATS**, provides precise work with sensors and HMI

It monitors the charging progress and the result in real time.

This allows you to manage explosives usage and provides data that predicts and improves productivity.



EagleVibs 24/7 Automatic Measurement



- Real-time measurement**
- **24/7 Vib. and Noise real-time measurement**

- Reliable data**
- Reliable data from auto measurement
 - Algorithm of Vib. and noise prediction optimized for the site.
- Auto-measurement**
- Cost-down and preventing human errors.

Eagle Vibs, vibration and noise measuring system of **HATS**, monitors blasting vibrations and noise.

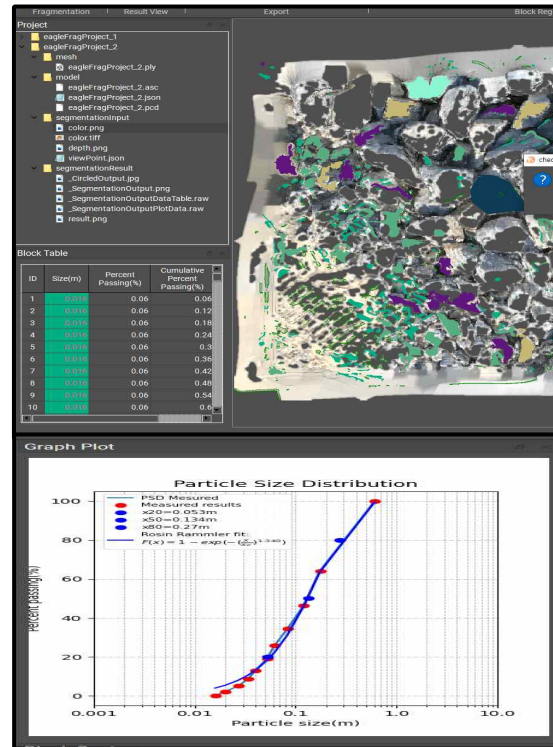
It's able to fix or move through the pit. After gathering the data, it's sent to the web server automatically.

The system has operational stability and automatic measurement with solar power module.

And it can take analysis report on Eagle Fine-sh...



AI-learning 3D analysis Software



3D Analysis AI-learning applied

- **3D based** analysis software
- **Proprietary Algorithm** for higher accuracy
- Learning rock size using scanned images
- Calculating the fragmentation without manual operation

Analysis efficiency

- Minimizing calculation time

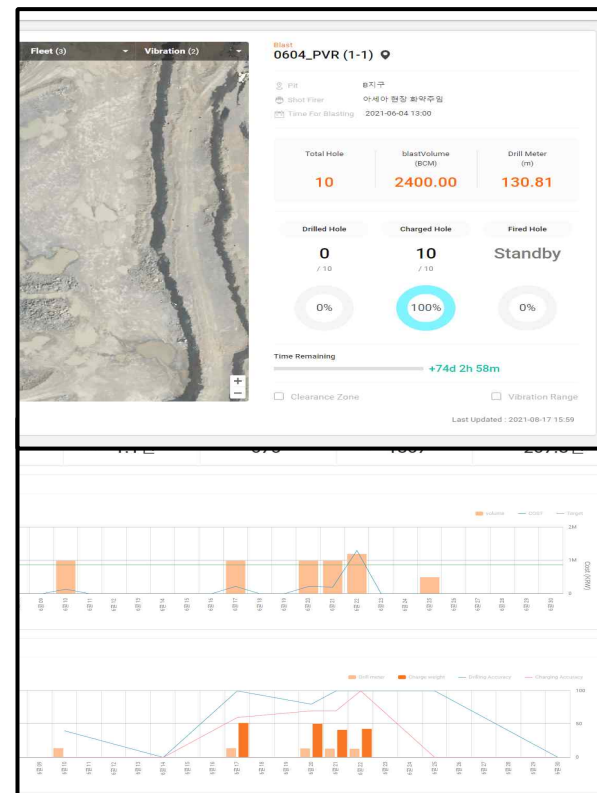
Eagle Frag, fragmentation software of **HATS**, analyzes the size of rock in 3D.

It uses scanned images by drone after the blasting.

AI-learning is applied to increase accuracy and shorten calculation time.



Process Management Solution



Real time management

- **Real-time monitoring** of the site information.
- Able to use various mobile devices

Statistical data Data

management

- Analysis and reporting of database
- Supporting site management
- **Web server** for data storage and platform
- Total storage of pattern, process, and result information



















EagleFineweb, main web site of **HATS**, displays real-time site information in real-time and provides **Data Platform** services.

It also can provide control system of the site in a remote condition.

So, It supports insight to report productivity and improve site management.



Real time Management System

모니터링	장비명
  	MPU-01
  	MPU-02
  	MPU-03
  	MPU-04
  	Loader-01
  	Loader-02

Fleet

management

Operation

management

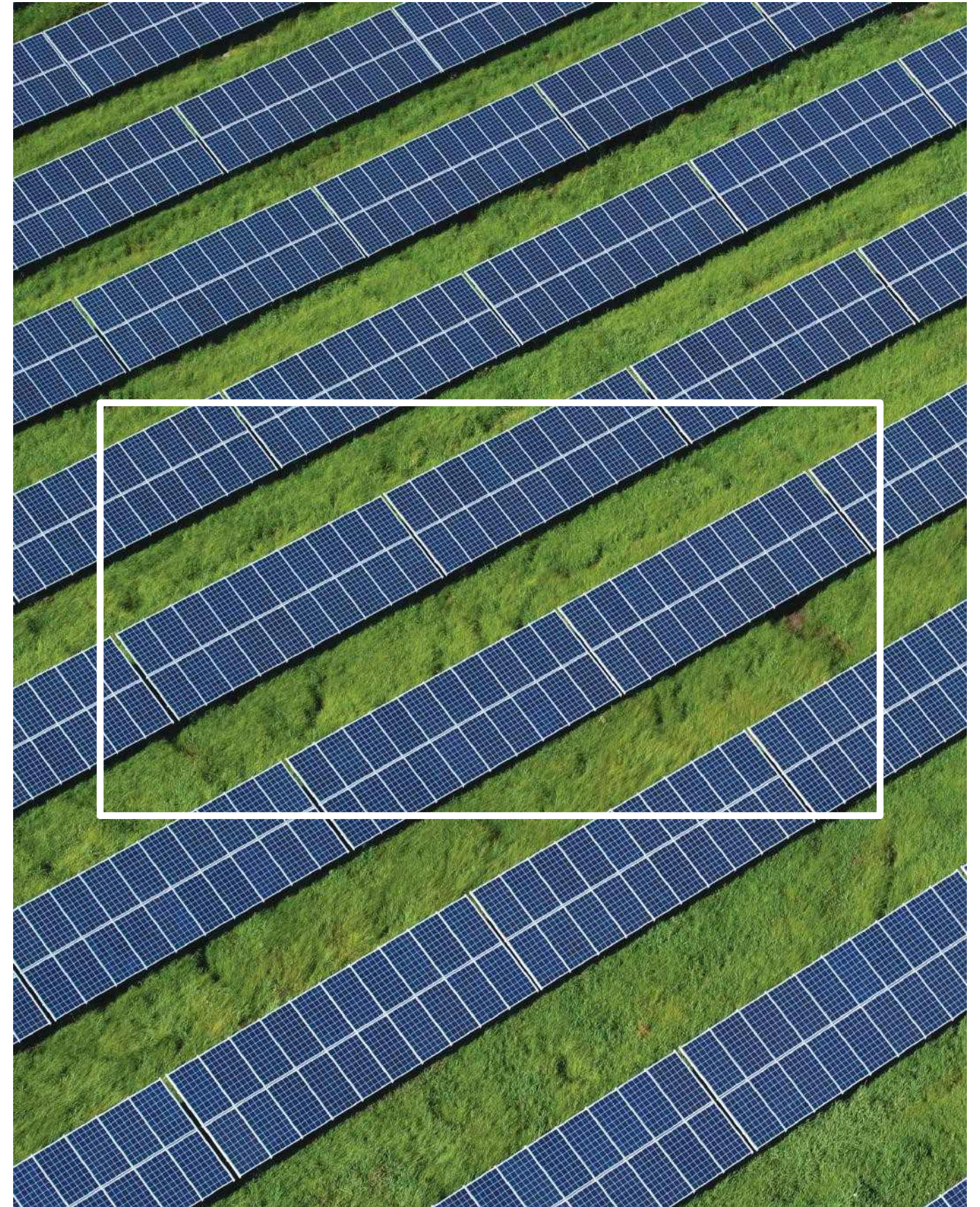
Safety

management

- Real time monitoring of the site
- Able to use various mobile devices
- **Auto-check of production in real time.**
- Automatic data gathering by transport area.
- Wireless communication between equipment
- Strengthen safety management

Eagle FMS, fleet management system of **HATS**, provides monitoring on-site equipment, labors and vehicles.

It can be tracking all equipment including drills, and MPUs. Also it provides real-time location, status, and working information.



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2. DBS 관련 부서 담당자 개발자 연락처 필요

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