

# 新能源

## New Energy



上海电气  
SHANGHAI ELECTRIC

上海电气电站设备有限公司发电机厂  
Shanghai Electric Power Generation Equipment Co., Ltd. Generator Plant



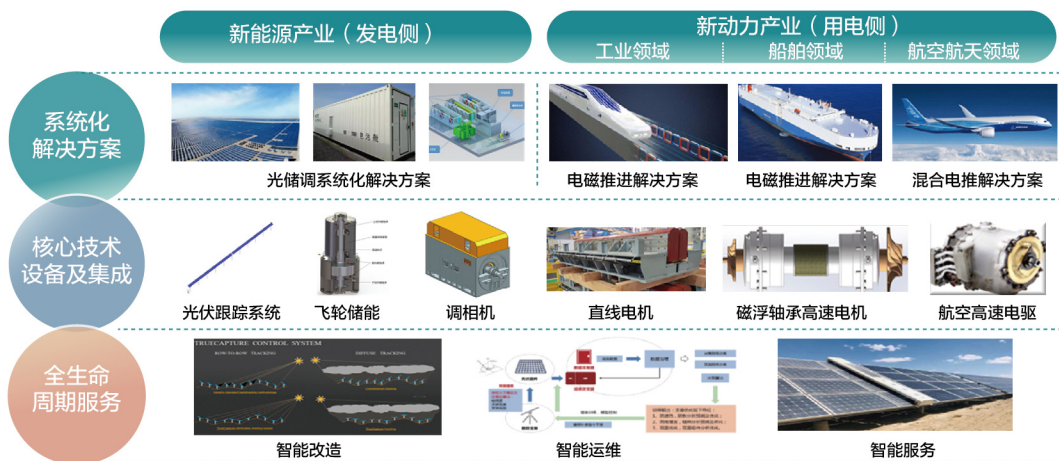
## 总体介绍 General Introduction

致力于提供从发电到用电全产业链的关键环节系统化解解决方案、具有核心技术的设备集成和全生命周期服务。新能源不止于新能源。

Committed to providing systematic solutions for key links in the entire industrial chain from power generation to electricity consumption, equipment integration with core technologies, and full lifecycle services. New Energy beyond New Energy.

# 新能源产品线全景图

## Panorama of the product line in the New Energy



## 产品线布局（4+X） Product Line Layout(4+X)

4: 代表4种市场前景明确、重点进军的产品

X: 代表重点培育的若干新方向

4: Representing four products with clear market prospects and key entry points.

X: Representing several new directions of key cultivation.



## 光伏承载系统 Photovoltaic Bearing System

### 跟踪光伏承载系统

#### Tracking photovoltaic carrier system

市场常见的各类光伏承载系统（包括固定支架、可调支架、柔性支架、平单轴、斜单轴、双轴等），均有设计能力及供货业绩。

NEBU has design capabilities and supply performance for various common photovoltaic bearing systems in the market, including fixed brackets, adjustable brackets, flexible brackets, flat single axis, inclined single axis, dual axis, etc.

1P、2P平单轴承载系统，产品性能指标达到国际一流水平，并具备先进性、经济性、可靠性和便捷性，性价比高。

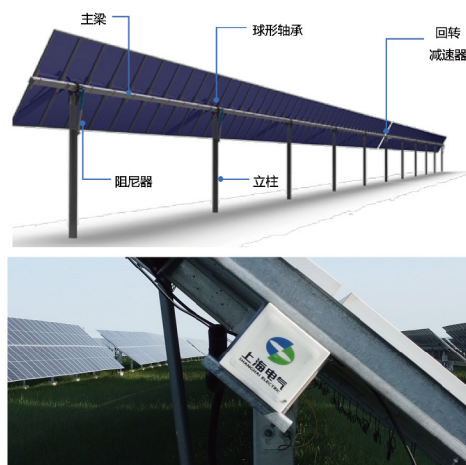
1P and 2P flat single axle bearing systems, whose product performance indicators have reached the world-class level, and are progressiveness, economical, reliable, convenient, and cost-effective.

**产品系列:** 1P（90米长以内可定制）、2P（75米长以内可定制）、山地固定可调

**Product series:** 1P (customizable within 90 meters), 2P (customizable within 75 meters), mountain fixed and adjustable

**应用领域:** 集中式光伏电站，多建于沙漠、平原、丘陵地区。

**Application field:** Centralized photovoltaic power plants, mostly built in desert, plain, and hilly areas.





## □ 产品优势:

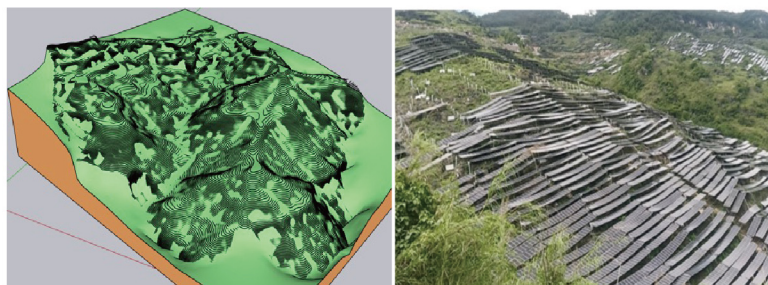
- 1P单平轴承载系统技术成熟可靠, 抗风性能强, 降低度电成本;
- 2P单平轴承载系统用桩量低, 可降低初始投资成本, 降低度电成本, 结构刚度媲美固定支架;
- 山地固定可调: 大排长, 坡度适应能力强, 可适应山地等复杂地形。
- 典型项目: 宁夏红寺堡20M平单轴支架

## □ Product advantages:

- The 1P flat single axle bearing system has mature and reliable technology, strong wind resistance performance, and reduced electricity costs;
- The 2P flat uniaxial bearing system has a low number of piles, which can reduce initial investment costs and electricity costs. Its structural stiffness is comparable to that of fixed brackets;
- Mountainous fixed and adjustable: large platform length, strong slope adaptability, and can adapt to complex terrain such as mountainous areas.
- Typical project: Ningxia Hongsibao 20M flat single axis support

## 柔性光伏承载系统

Flexible photovoltaic bearing system



柔性支架, 其空间结构合理, 用钢量少、自重轻, 且对场地要求低、占地少。适用于渔光互补、农光互补等复杂环境。

Flexible supports, which have a reasonable spatial structure, low steel consumption, light self weight, and low requirements for the site, occupying less land. Suitable for complex environments such as complementary fishing and agricultural lighting.

## □ 应用领域: 山地、矿区、矿山、鱼塘、盐池、水厂、农场农田

□ Application field: mountainous areas, mining areas, mines, fish ponds, salt ponds, water plants, farms and farmland

## □ 产品系列: 山地柔性支架、渔/农光互补柔性支架

□ Product series: Mountain flexible bracket, fishing/agricultural light complementary flexible bracket

## □ 产品优势:

- 山地柔性支架采用顺坡平铺布置, 可有效提升装机容量, 提高土地利用效率, 有效降低用桩量, 可降低初始投资成本;
- 渔/农光互补柔性支架采用大跨距预应力索桁架结构, 可满足光伏板下捕鱼、畜牧、农耕等需求, 实现一地两用, 同时有效降低用桩量, 可降低初始投资成本。

## □ Product advantages:

- The flexible support in mountainous areas is laid flat along the slope, which can effectively increase the installed capacity, improve land use efficiency, reduce the amount of piles used, and reduce the initial investment cost;
- The complementary flexible support for fishing/agricultural lighting adopts a large-span pre-stressed cable truss structure, which can meet the needs of fishing, animal husbandry, and farming under photovoltaic panels, achieving dual use in one place and effectively reducing the amount of piles used, thereby reducing the initial investment cost.

## □ 典型项目: 瑞皇30M柔性光伏承载系统

□ Typical projects: Ruihuang 30M flexible photovoltaic bearing system.

## 除草机器人 Weeding robot

事业部还提供智能除草机器人, 其性能优越, 高度智能化, 能够实现光伏电站特殊场景下的无人除草作业。

The business unit also provides intelligent weeding robots with superior performance and high intelligence, which can achieve unmanned weeding operations in special scenarios of photovoltaic power plants.



## □ 产品系列: SEC DHT350、SEC DHT650

□ Product series: SEC DHT350, SEC DHT650

## □ 应用领域: 集中式光伏电站、果园、林地、草坪

□ Application fields: centralized photovoltaic power plants, orchards, forests, lawns

□ 产品优势: SEC DHT系列除草机器人采用混合动力模式, 其车身上搭载有激光雷达、GPS/北斗定位模块等设备, 能够实现光伏电站、果园等复杂地形的无人除草作业。

□ Product advantage: The SEC DHT series weeding robots adopt a hybrid mode, and their body is equipped with equipment such as LiDAR, GPS/BeiDou positioning module, which can achieve unmanned weeding operations in complex terrains such as photovoltaic power plants and orchards.

# 调相机 Condenser

## 集中式调相机 Centralized condenser

新一代300Mvar调相机是目前世界上容量最大、具备双向快速调节能力的无功补偿装置，“动态特性好、安全可靠、运行维护方便”是其最显著特点，为提高特高压直流输电的安全性和稳定性提供可靠的支撑。

在集中式调相机领域，市场占有率达45%。具备调相机岛设计和设备供应，调相机全生命周期维护服务提供能力。

The new generation 300Mvar condenser is currently the world's largest capacity reactive power compensation device with bidirectional fast adjustment capability. Its most significant features are "good dynamic characteristics, high safety and reliability, and convenient operation and maintenance", providing reliable support for improving the safety and stability of ultra-high voltage direct current transmission. In the field of centralized condensers, the market share reaches 45%. Capable of designing and providing equipment for the condenser island, as well as providing full life cycle maintenance services for the condenser.

### □ 集中式调相机可解决特高压直流输电存在的：

- 特高压直流受端电网动态无功不足
- 特高压直流弱送端短路容量支撑不足
- 高比例受电地区动态无功不足

### □ The centralized condenser can solve the problems of ultra-high voltage direct current transmission:

- Insufficient dynamic reactive power of the UHV DC receiving end power grid
- Insufficient short circuit capacity support at the weak transmission end of ultra-high voltage DC
- Dynamic reactive power shortage in high proportion of electrified areas

□ 典型项目：国网湖南湘潭换流站2x300Mvar调相机，国网山东临沂换流站3x300Mvar调相机，国网江苏泰州换流站2x300Mvar调相机。

□ Typical projects: 2x300Mvar condensers at State Grid Xiangtan Hunan Converter Station, 3x300Mvar condensers at State Grid Linyi Shandong Converter Station, and 2x300Mvar condensers at State Grid Taizhou Jiangsu Converter Station.

### ● 同容量常规电机数据

#### 新一代调相机：

- 瞬时无功输出能力 **3倍以上**
- 短时无功输出能力 **2~3倍**
- 过负荷持续时间 **5~10倍**
- 快速响应速度 **2倍以上**



## 分布式调相机 Distributed condenser

在分布式调相机领域，我们有10~100Mvar分布式调相机，冷却方式有闭式空水冷、开启式空空冷；布置方式有预制舱式、厂房布置式等多种供客户选择。具备调相机岛、相关设备和全生命周期运维解决方案设计提供能力。

In the field of distributed condensers, we have a range of 10~100Mvar various types of products available for customers to choose. The cooling methods, we have closed air water-cooling and open air-air cooling. The layout methods include prefabricated cabin and factory layout, etc. Fully capable of providing design and maintenance solutions for condenser islands, related equipment, and full lifecycle operations.

### □ 解决新能源入网存在的：

- 送端系统暂态过电压问题
- 系统短路容量支撑不足
- 系统转动惯量不足

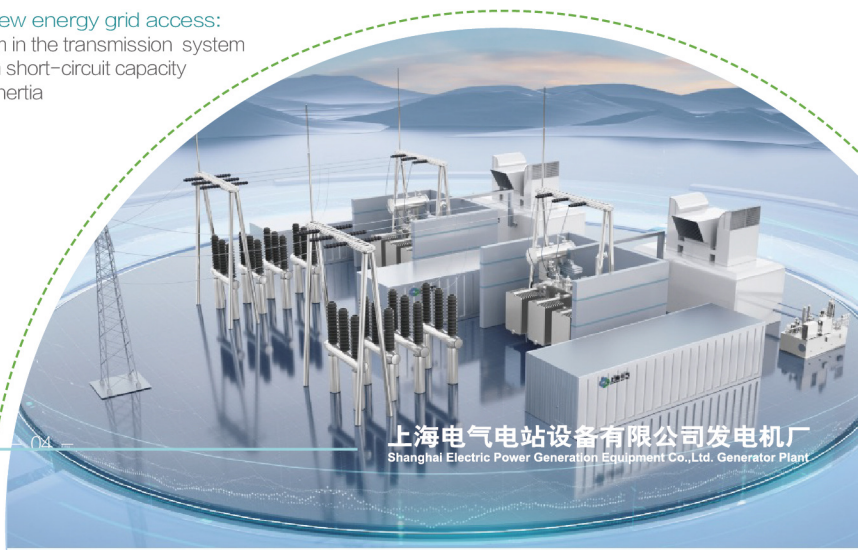
### □ Solving the problems of new energy grid access:

- Transient overvoltage problem in the transmission system
- Insufficient support for system short-circuit capacity
- Insufficient system rotational inertia

### □ 典型项目：

京能织女泉2x10Mvar，中广核 兴安盟4x50Mvar，特变新园50Mvar 风盛2x30Mvar，黄河水电4x50Mvar。

□ Typical projects: Jingneng Zhinvquan 2x10Mvar, Zhongguanghe Xinganmeng 4x50Mvar, Te bian xin yuan 50Mvar Fengsheng 2x30Mvar, Huang he shui dian 4x50Mvar.

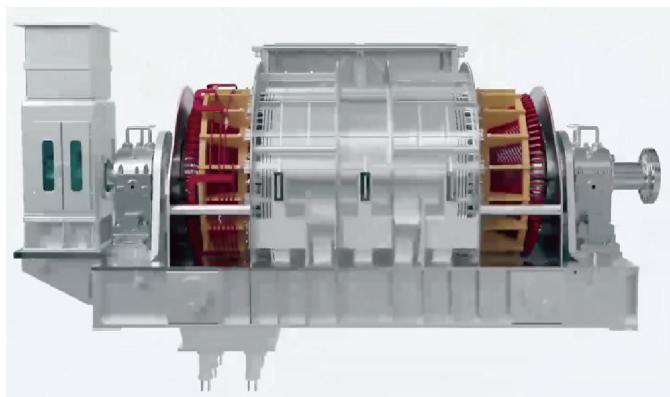


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## 压缩空气储能

### Compressed air energy storage



针对压缩空气储能的特殊需求，开发与之配套的100~350MW级发电机、100MW级发电电动一体机。该产品融合上海发电机厂70余年的大型汽轮发电机设计、制造、服务经验，运行可靠、性能稳定、布置灵活、效率高，可适应压缩空气储能的频繁起停需求。

In response to the special needs of compressed air energy storage, we have developed matching 100~350MW level generators and 100MW level electric integrated generators.

This product integrates over 70 years of experience in the design, manufacturing, and service of large-scale steam turbine generators from Shanghai Generator Factory. It is reliable in operation, stable in performance, flexible in layout, and highly efficient, and can adapt to the frequent start and stop needs of compressed air energy storage.

□ **典型项目：** 中科100MW和300MW级双水内冷空气压缩储能

□ **Typical projects:** Zhongke 300MW dual water internal cooling air compression energy storage

## 飞轮储能

### Flywheel energy storage

已开发完成的MW级感应子储能电机，目前国内单机功率最大。

The MW level induction energy storage motor that has been developed is currently the largest single machine power in China.

□ **产品参数：** 3MW/27MJ，合金钢锻件飞轮

□ **Product parameters:** 3MW/27MJ, alloy steel forging flywheel

□ **应用领域：** 脉冲功率电源领域

□ **Application field:** Pulse power supply field

□ **产品优势：**

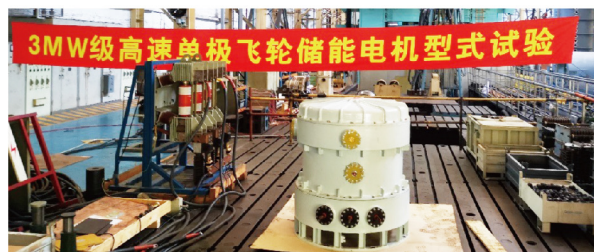
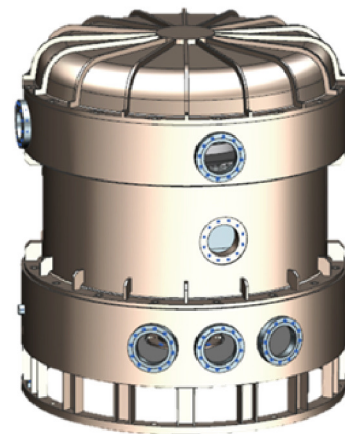
- 长寿命，系统可靠性与安全性高，转子与飞轮一体式设计，功率密度高，体积小，立式设计布置灵活。
- 正在开发大功率、高容量、长放电时间的飞轮储能系统，面向电网调频领域，提供系统解决方案。

□ **Product advantages**

- Long service life, high system reliability and safety, integrated design of rotor and flywheel, high power density, small size, and flexible vertical design layout.
- We are developing a high-power, high capacity, and long discharge time flywheel energy storage system to provide system solutions for the field of power grid frequency regulation.

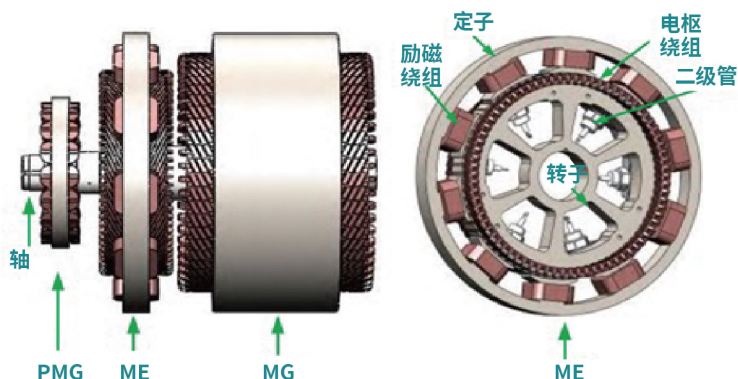
□ **典型项目：** 中国航空第三设计院储能电机项目、500kW-20kWh高速永磁飞轮储能电机

□ **Typical projects:** China Aviation Industry Third Design and Research Institute Energy Storage Motor Project, 500kW-20kWh high-speed permanent magnet flywheel energy storage motor



## X: 航空高速电驱

### X: Aviation high-speed electric drive



通过研制航空高速混合电驱发电机，进入航空领域。  
该产品，是事业部面向未来培育的重点新产品。

By developing high-speed hybrid electric drive generators for aviation, we have entered the aviation industry. This product is a key new product developed by the business unit for the future.

□ **典型项目:** 中国商飞北京民用飞机技术研究中心  
600kW 启发一体机、中国航空发动机研究院  
1000kW 启发一体机

□ **Typical projects:** COMAC Beijing civil aircraft Technology Research Center 600kW Enlightened all-in-one aircraft, China Aviation Engine Research Institute 1000kW Inspiration Integrated Aircraft

## X: 高速磁浮电机

### X: High speed maglev motor

船舶用高速磁浮轴承压缩膨胀一体机，目前国内尚属空白，完全依赖进口。该产品，也是事业部面向未来培育的重点新产品。

The high-speed maglev bearing compression and expansion integrated machine for ships is currently a blank in China and completely relies on imports. This product is also a key new product that the business unit aims to cultivate for the future.

□ **产品参数:** 245kW, 30000rpm

□ **Product parameters:** 245kW, 30000rpm

□ **应用领域:** 船舶用天然气液化领域、其他压缩膨胀领域

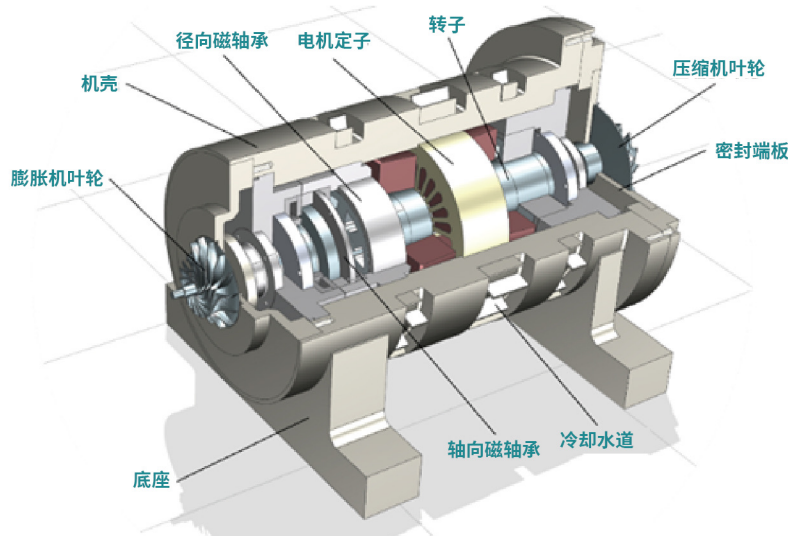
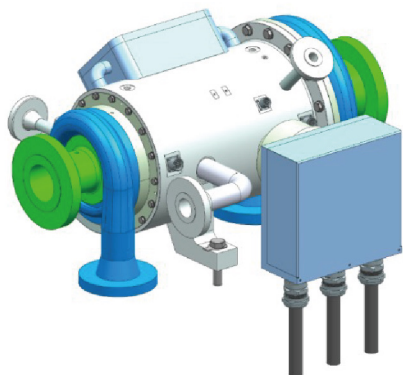
□ **Application field:** natural gas liquefaction for ships, other compression and expansion fields

□ **产品优势:**

采用压缩膨胀一体式设计，轴系短，体积小，布置灵活。耐高压密封，正压防爆设计。全磁浮轴承设计，可适应恶劣复杂运行环境。

□ **Product advantages**

Adopting a compression expansion integrated design, with a short shaft system, small size, and flexible layout. High pressure sealing, positive pressure explosion-proof design. The design of all magnetic levitation bearings can adapt to harsh and complex operating environments.



□ **典型项目:** 中国船舶重工集团公司第七一一研究所245kW高速压缩膨胀一体机项目

□ **Typical projects:** 245kW high-speed compression and expansion integrated machine project at the 71st Research Institute of China Shipbuilding Industry Corporation