

Power Equipment & New Energy & Utilities & ESG

欧洲负电价频发，储能经济效益改善

Negative Electricity Prices Frequently Occur in Europe, Improving the Economic Benefits of Energy Storage

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热点速评 Flash Analysis

(Please see APPENDIX 1 for English summary)

随着欧洲太阳能发电量激增，电力价格再次出现负值。根据欧洲电力交易所 EPEX SPOT 的数据，7月初欧洲电力市场出现周末接近一整天负电价的情况，其中，德国与荷兰中午时段甚至出现负 500 欧元/兆瓦时的价格，主要原因是欧洲光伏发电激增，导致电力供应的阶段性过剩。根据 SolarPower Europe 的数据，2022 年欧洲地区新增太阳能装机 41GW，预计 2023 年光伏装机容量可新增 54GW-68GW，增幅达到 31.7%-65.8%。

负电价的出现是由于用电需求低迷，以及可再生能源装机占比持续提高。**需求侧：**欧盟能源部长在去年 9 月底同意欧洲委员会提出的用电量减少 10%，每月用电高峰时段强制削减 5% 的方案；同时欧洲各国工业陷入低迷，制造业面临下行压力，工业用电减少。**供给侧：**2012 年欧洲清洁能源发电量首次超过化石能源，此后剪刀差在十年内持续扩张，清洁能源装机占比从 2008 年的 49% 提升至 2022 年的 67%，2020-2022 年，欧洲风光合计新增装机 33GW/43GW/61GW。欧洲的去煤计划较为激进，多数用煤国家均计划在 2030 年前退煤，欧洲煤电和核电的发电量持续减少，风电和光伏发电成为主要的发电增量补充，未来煤电的去化速度或将提速，光电的装机量预计保持高速增长。当前夏季气温高、日照时间长，光伏出力较大，叠加用电需求低迷以及储能调峰能力不足等因素，负电价频繁出现。

负电价有望增加储能峰谷套利收益，提高储能经济性。欧洲电力市场可以分为电力批发市场和系统服务市场，批发市场主要交易电能量，而系统服务市场主要提供辅助服务。从交易周期来看，可以分为中长期市场、日前市场、日内市场和实时平衡市场，四个市场互补完成电力出清。目前，欧洲电力市场通过边际定价的模式，按照发电机组的调峰能力依照新能源、水电、核电、煤炭和天然气的发电顺序上网，市场供需所形成的电力批发价主要由提供最后一兆瓦的发电机组成本（天然气价格）决定。随着欧洲天然气供给逐渐缓解，天然气价格回落，欧盟电价已基本恢复到俄乌冲突前的水平，但价格中枢仍高于往年平均水平，未来的厄尔尼诺现象可能导致极端天气出现，使得天然气价格受到需求带动上行，电价也随之提升；同时，夏季以来光伏出力加大使得负电价频发且时间拉长，拉大了峰谷价差，储能的峰谷套利收益预计有所改善，储能经济性进一步提高。

总结：近年来，欧洲地区清洁能源装机比例不断提升，2022 年占比已经达到 67%，风光合计新增装机约 61GW，新能源发电激增导致电力供应出现阶段性过剩。为了稳定实现能源转型，欧洲需要大幅提升电网容量，提升国内和跨境的长距离输电能力及调度能力，以促进新能源消纳。未来欧洲对智慧电网、虚拟电厂，以及储能的需求也会大幅增加，来匹配可再生能源的装机速度。

投资建议：建议关注储能电池制造商【宁德时代】、【亿纬锂能】，特高压电气设备供应商【中国西电】。

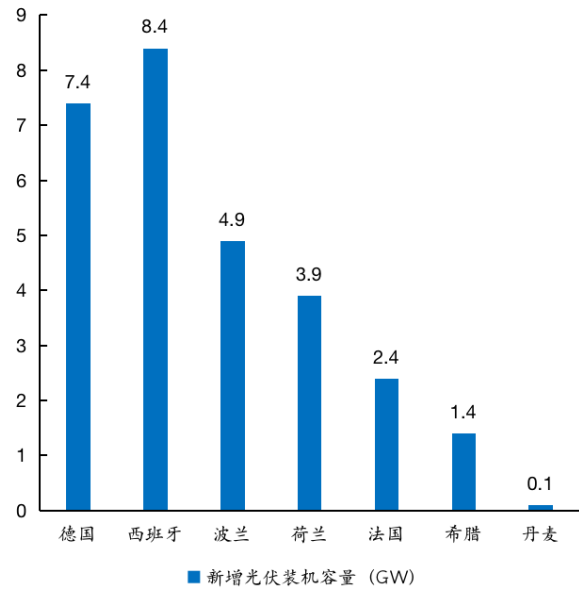
风险提示：政策和需求不及预期，新能源装机不及预期。

图 1: 2023 年 7 月 2 日 欧洲各国部分时段电价



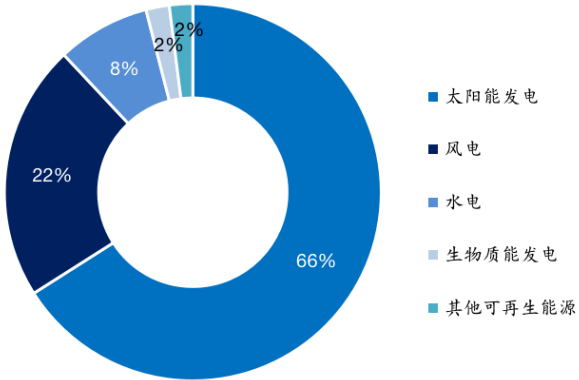
资料来源: EPEX SPOT, HTI

图 2: 2022 年欧洲主要国家光伏新增装机容量



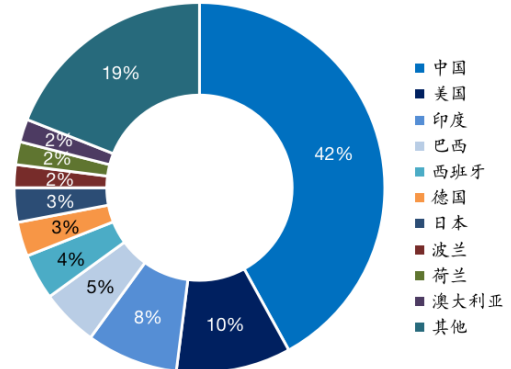
资料来源: SolarPower Europe, HTI

图 3: 2022 年全球可再生能源新增装机占比



资料来源: SolarPower Europe, HTI

图 4: 2022 年全球 GW 级光伏市场装机占比



资料来源: SolarPower Europe, HTI

APPENDIX 1

Negative Electricity Prices Frequently Occur in Europe, Improving the Economic Benefits of Energy Storage.

According to data from the EPEX SPOT, in early July, the European electricity market experienced negative electricity prices for a whole day on weekends. Among them, Germany and the Netherlands even had negative electricity prices of 500 euros/MWh at noon.

The emergence of negative electricity prices is due to the sluggish electricity demand and the continuous increase in the proportion of renewable energy installed capacity. Demand side: At the end of September last year, the European Union's energy ministers agreed with the European Commission's plan to reduce electricity consumption by 10% and force a 5% cut in peak hours of electricity consumption every month. Supply side: In 2012, the power generation capacity of clean energy in Europe surpassed that of fossil energy for the first time. Since then, the scissors gap has continued to expand within a decade, and the proportion of installed capacity of clean energy has increased from 49% in 2008 to 67% in 2022. From 2020 to 2022, the total new installed capacity of wind and PV power in Europe was 33GW/43GW/61GW.

Negative electricity prices are expected to increase the peak and valley arbitrage income of energy storage and improve the economics of energy storage. As the supply of natural gas in Europe gradually eased, the price of natural gas fell, and the price of electricity in the EU has basically returned to the level before the conflict between Russia and Ukraine, but the price center was still higher than the average level of previous years. The El Nino phenomenon in the future may lead to extreme weather, which will drive up the price of natural gas due to demand, and the price of electricity will also increase accordingly. Meanwhile, the increase in PV output since summer has led to frequent and prolonged negative electricity prices, widening the peak-to-valley price difference. The peak-to-valley arbitrage income of energy storage is expected to improve. In the future, Europe's demand for smart grids, virtual power plants, and energy storage will also increase significantly to match the installation speed of renewable energy.

Investment suggestion: Energy storage battery manufacturers: CATL, EVE; UHV electrical equipment suppliers: China XD Group

Risks: less-than-expected growth in demand and policy; less-than-expected new energy installed capacity.

附录 APPENDIX

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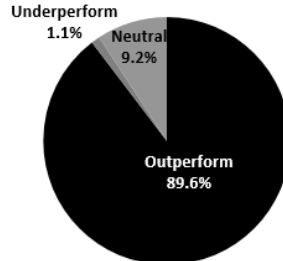
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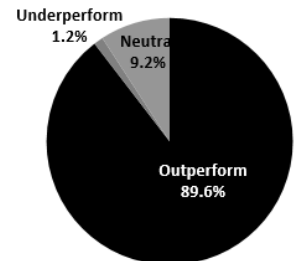
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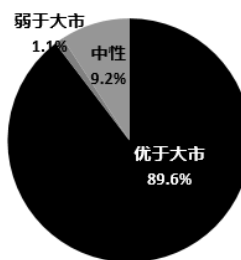
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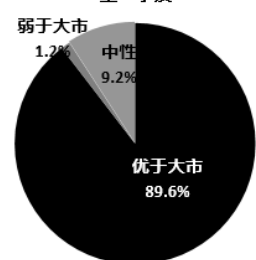
Prior Full Quarter



最新季度



上一季度



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