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Newsletter

Sep 2020

BMS电池管理系统介绍 Introduction of BMS

李消非：流水线
Li Xiaofei: Assembly Line



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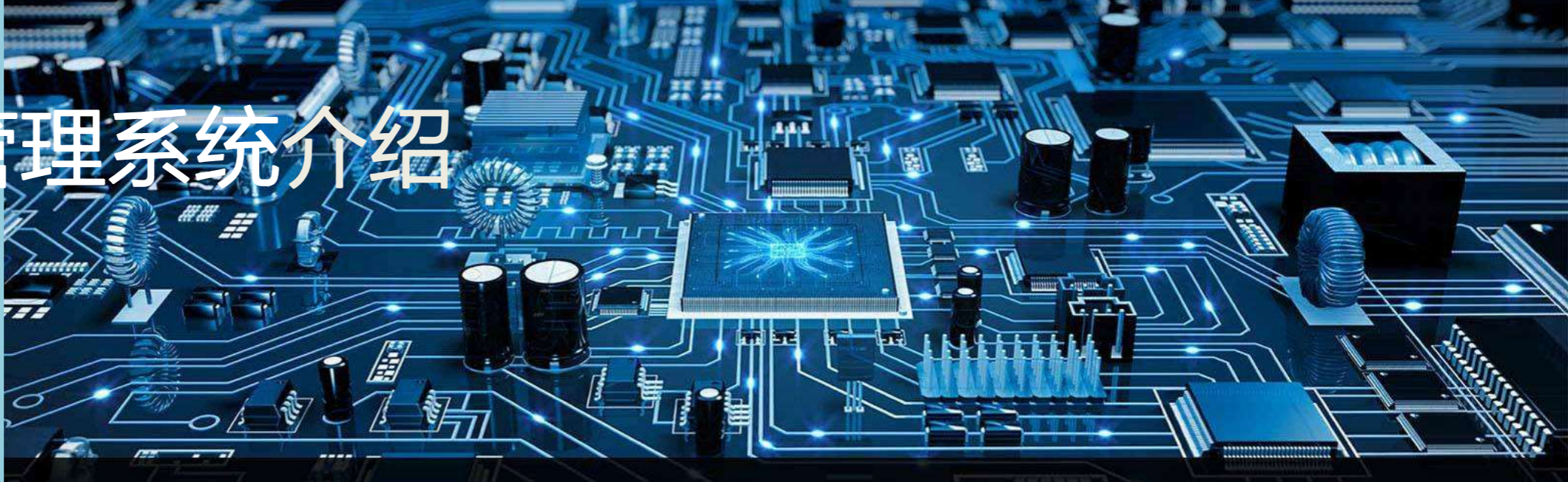
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BMS电池管理系统介绍

编辑: Urbanus

某种意义上讲, BMS (电池管理系统) 指的是以某种方式监控和保护电池的各种电子设备的统称。BMS是一种电池监测设备, 它可以采取措施保护电池免受某些可能损坏或缩短电池寿命的使用行为或其他情形的影响。

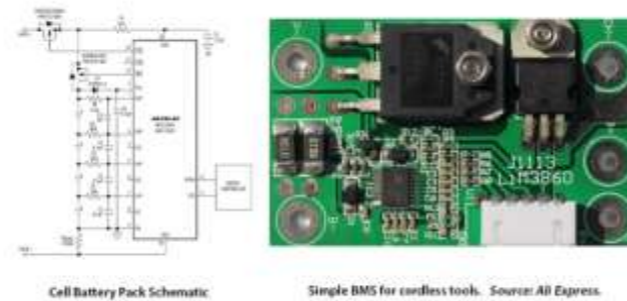


那么为什么 **BMS** 的功能一样, 价格却会从10美元到几千美元不等呢?

一个恰当的类比应该是问为什么交通系统的价格差别如此之大, 因为交通系统可能是指一个机动滑板亦或者一辆运输卡车。让我们仔细看看这个类比是如何在电池管理系统中实现的。

小型设备

关于 **BMS** 一个低端需求的例子是如何保护像无绳钻这样的小型设备的电池组。典型的无绳钻包含大约5或6个电池串联, 电池总成本约为30美元。显然, 为了维持市场的生存能力, 电池管理系统必须非常便宜; 一个通常不到10美元, 功能仅限于最基本的保护。这种 **BMS** 更准确地称为电池保护器。这些系统监测电池电压和电池组电流, 并在电压或电流超出范围时打开一个或两个背靠背的 **FET**。这些范围限制在制造时是固定的, 有时也包括过热保护。这些系统通常不包括平衡, 是独立的, 与其他系统没有通信。



Cell Battery Pack Schematic

Single BMS for cordless tools. Source: All Express.

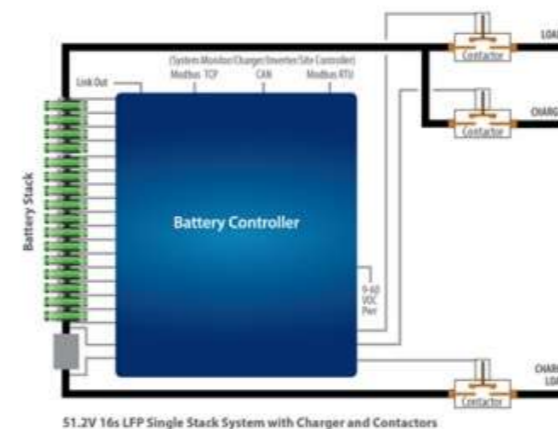
下一个级别是电动自行车, 通常使用36V电池组。这种应用的锂离子电池组约为0.5千瓦时, 成本约为200至300美元。与无绳钻不同的是, 更长的电池寿命对客户来说很重要, 而且自行车的总价格也符合这一预期, 因此电池平衡成为必要项目。 **BMS** 还必须能够连接到某种形式的“煤气表”显示器上, 以向用户显示电池的剩余电量。除此功能外, 还需要为维修人员提供诊断端口。这个 **BMS** 大约在30到50美元之间。

住宅储能系统

每次提升一个级别, 风险也会相应增加, 但是这一次在某些方面增加了一个数量级。住宅 **behind-the-meter** 储能系统通常在48V范围内, 提供7千瓦时-20千瓦时, 在这个阶段, 平衡性能和监控电池参数必须得到很好的实现, 同时也要支持安装和服务公司能够执行远程监控和事件记录来管理客户的安装 (因为大多数业主在技术上无法管理他们自己的系统)。服务卡车转载费用昂贵, 远程访问可以消除许多不必要的呼叫。这通常意味着需要以太网接口以及软件支持, 例如可以远程运行的基于浏览器的 **GUI**, 以及事件日志推送, 以便在发生故障或未决故障时提供优先级通知。这种应用的 **BMS** 通常在250美元到500美元之间。

移动储能

大型移动电源系统, 如电动卡车或船舶, 移动储能应急电源, 或移动家庭生活空间的电力, 使 **BMS** 设计更上一层楼。在这个例子中, 电池组的定价范围很广, 从家用移动辅助电源的几千美元到一个可以装满长途拖车的移动应急能源系统的50万美元。移动系统通常需要一个 **CAN** 接口 (这在车辆中最常见), 并且还需要使用专门为这些类型的应用设计的逆变器。此外, 当这些系统返回 **home base** 或其服务中心时, 通常需要将它们连接到服务和监控计算机, 以下载事件、操作参数和数据日志, 以便于维护。以上最好通过以太网连接完成, 并且这需要 **BMS** 的软件支持。根据电池组的标称电压和并联电池组的数量, 这种应用的 **BMS** 从300美元到10000美元不等。



*资料来源于 novationenergy.com

Introduction of BMS (Battery Management System)



Edit by Urbanus

The term **BMS** refers to a wide variety of electronic devices that monitor and protect the battery in some way. A battery management system is a battery monitoring device that can take actions to protect the battery from certain usage or other conditions that could damage or shorten the life of the cells.

So why do BMS prices range from \$10 to several thousand dollars if they all do the same thing? An appropriate parallel would be to ask why motorized transportation systems vary so greatly in price, with a motorized skateboard at one end of that spectrum, and a transport truck at the other. Let's take a closer look at how this analogy plays out with battery management systems.

Small Devices

An example at the small end of BMS requirements is what is needed to protect a battery pack for a small device like a cordless drill. The typical cordless drill contains around 5 or 6 cells in series with the total cell cost of about \$30. Clearly the BMS must be very inexpensive to maintain market viability; one is typically under \$10 and functionality is limited to most basic protection. This BMS would be more accurately referred to as a battery protector. These systems monitor cell voltage and pack current and open one or both back-to-back FETs in the event of voltage or current going out of range. These range limits are fixed at time of manufacture. Over-temperature protection is also sometimes included. These systems often do not include balancing and are standalone, with no communications to other systems.

Moving up a level would be electric bikes, which typically use 36V battery packs. A lithium-ion battery pack for this application is about 0.5 kWh and costs about \$200 to \$300. Unlike the cordless drill, a longer battery lifespan is important to the customer, and the bike's total price point is aligned with that expectation, so cell balancing becomes mandatory. The BMS must also be able to connect to some form of "gas gauge" display that shows the user how much power is left in the battery. In addition to this functionality a diagnostic port for service personnel is also desirable. This BMS is around \$30 to \$50.

Residential Energy Storage Systems

The next level up from these smaller systems to a low-voltage residential energy storage system raises the stakes yet again, this time by an order of magnitude in certain respects. Residential "behind-the-meter" energy storage systems are often in the 48V range, provide 7 kWh-20 kWh, and cost about \$5K-\$20K. At this stage balancing performance and monitoring battery parameters must be well implemented and also support the needs of installation and service companies to be able to perform remote monitoring and event logging to manage their customers' installations (since most home owners are not technically able to manage their own systems). Service truck rolls are expensive and

the availability of remotely accessible information can eliminate many unnecessary calls. This usually means an ethernet interface is required as well as software support such as a browser-based GUI that can be run remotely, and event log pushing to facilitate priority notifications in the event of faults or pending faults. A BMS for this application is typically in the \$250 to \$500 range.

Mobile Energy Storage

Large mobile power systems for things like electric trucks or boats, mobile energy storage for emergency power, or power for the living space of a mobile home take us to the next level up in BMS design. There is a wide range of battery pack pricing in this example, from a few thousand dollars for mobile home auxiliary power to \$500K for a mobile emergency energy system that can fill a long-haul trailer. Mobile systems usually require a CAN interface (which is most common in vehicles) and also use inverters specifically designed for these types of applications. In addition, when these systems return to home base or their service center it is usually desirable to connect them to a service and monitoring computer to download events, operational parameters, and data logs for maintenance purposes.

This is best done through an Ethernet connection, which requires software support from the BMS. A BMS for this application can easily range from \$300 to \$10,000 depending on the nominal voltage of the battery stack and quantity of parallel stacks. For example, a 48V system needs to monitor and balance 14 to 16 cells depending on the type of lithium battery cells used, whereas a 1200V system could be monitoring 320 cells; large ISO container size systems usually have multiple stacks (also referred to as 'strings') in parallel in order to scale up to large enough energy levels. This means 10 to 20 times 320 cells to monitor, plus an overall management system to aggregate all the stacks into a single system representation.

*The source is from novationenergy.com

三希科技集团参加SbSTC 一步步新技术研讨会

撰文：Urbanus



3CEMS集团广上科技（广州）有限公司员工出席研讨会

9月23日,由《SMT China表面组装技术》杂志主办的SbSTC一步步新技术研讨会于深圳天安云谷（坂田）国际会议中心隆重举行。该研讨会以“先进的电子制造工艺与智能工厂转型升级方案”为主题，吸引了来自粤港澳大湾区的技术人士将齐聚一堂，聚焦智能制造，共享开放创新。三希科技集团作为特邀参会企业应邀出席本次研讨会。

尽管国内外受疫情影响形式严峻，但是今年上半年电子信息制造业增加值依旧同比增长了5.7%，实现营收5.14万亿元，在制造业中占比达到了12.7%。作为电子制造服务的龙头企业，在电子制造行业稳步发展的背景下，借助多年累积的行内资源优势以及迎接挑战创造新机遇的姿态，三希科技集团上半年顺利实现超预期的营收。

研讨会上，来自行业内的技术专家进行了包括“5G产品微小化趋势和SiP必备的贴装工艺”、“功能模块种类及焊接制程要求”、“电子产品DFM设计之板级热设计：如何做到板级散热的有效及可靠”等主题的讨论。来自三希科技集团设计研发，工艺，生产和制程团队的人员进行了细心的聆听，积极参与行业交流。

随着产品向少量多样的个性化需求趋势发展，柔性制造备受业内关注。会后，三希科技集团在主办方的带领下参观了SVV集团的柔性产线。

至此，SbSTC一步步新技术研讨会在深圳圆满落下帷幕。对于智能工厂现代化转型与可靠性提升，三希科技集团亦会坚持不断探索，努力为客户创造更完善更可靠更智能的制程和服务。

3CEMS Group Attended SbSTC New Technology Seminar

Written by Urbanus

On September 23, the **SbSTC** Step-By-Step New Technology Seminar sponsored by SMT China Surface Assembly Technology magazine was held in Shenzhen Tian'an Yungu (Bantian) International Conference Center. With the theme of "Advanced Electronic Manufacturing Technology and Smart Factory Transformation Upgrading Scheme", the seminar attracted technical personnel from whole Guangdong Greater Bay Area to gather together to focus on intelligent manufacturing and innovation. 3CEMS Group was invited to attend the Seminar as an EMS enterprise.

Despite the severe impact of the epidemic situation at domestic and abroad, the value-added of the electronic manufacturing industry in the first half of this year increased by 5.7% year-on-year, with revenue of 5.14 trillion Chinese yuan, accounting for 12.7% of the manufacturing industry. As a leading enterprise of electronic manufacturing services, under the background of the steady development of the electronic manufacturing industry, with the help of the accumulated advantages of resources in the industry for many years and the attitude of meeting challenges and creating new opportunities, 3CEMS Group did successfully achieve more than expected revenue in the first half of the year.

At the Seminar, technical experts from the industry discussed topics such as "5G Product Miniaturization Trend And Stp Necessary Mounting Process", "Functional Module Types And Welding Process Requirements", "Board Level Thermal Design Of Electronic Product DFM Design: How To Achieve Effective And Reliable Board Level Heat Dissipation". The staff from 3CEMS Group's R & D, Process, Production and Mechanical Engineering teams listened attentively and actively participated in industry exchanges.

After the seminar, 3CEMS Group visited the flexible production line of SVV group under the organizer.

So far, the SbSTC New technology seminar has come to a successful conclusion in Shenzhen. For the modernization transformation and reliability improvement of S-Factory, 3CEMS Group will continue to explore and strive to create more perfect, reliable and intelligent process and service for our customers.



3CEMS Group Prime Technology colleagues attended this seminar.



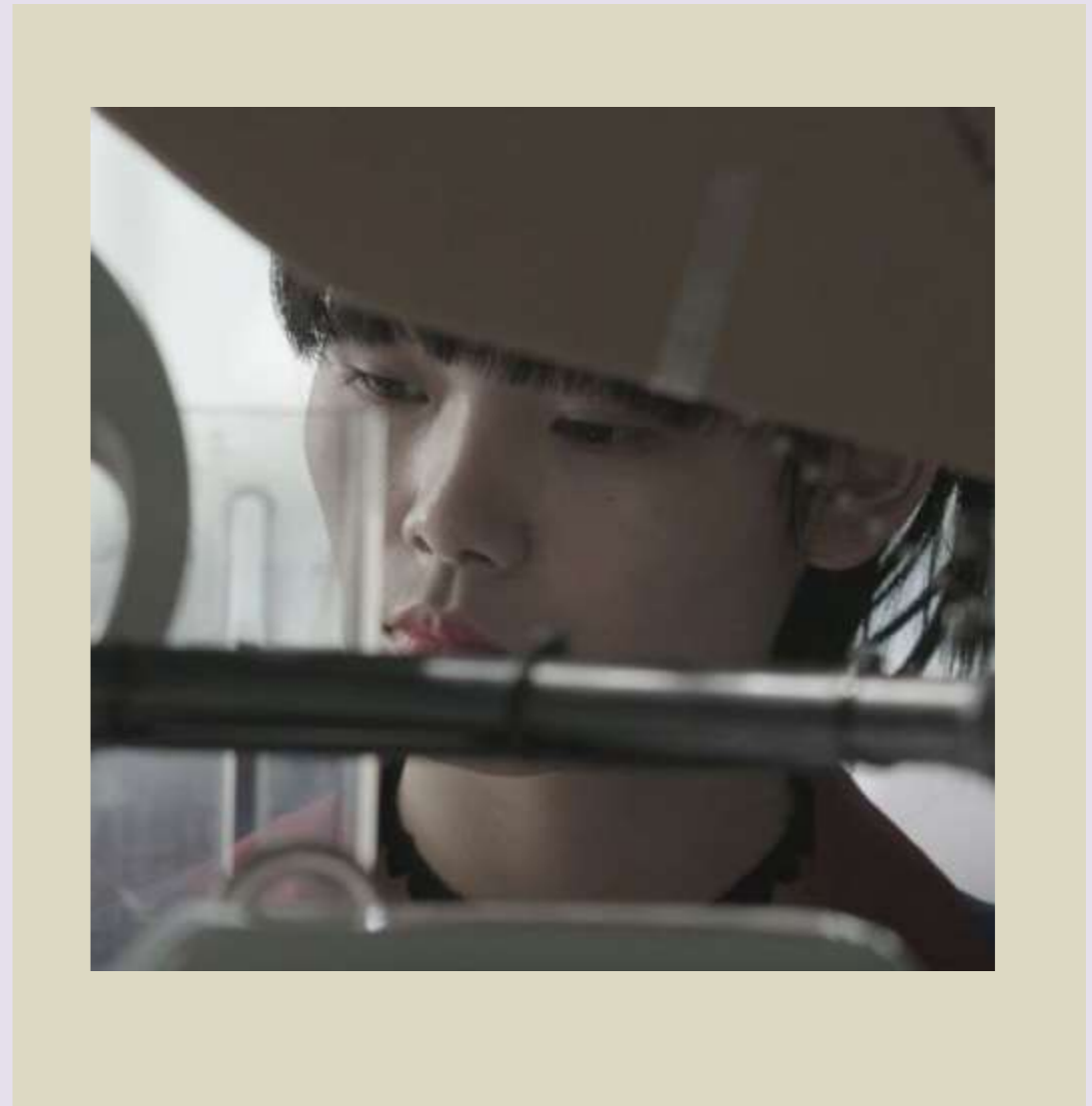
三希科技集团在主办方的带领下参观了SVV集团的柔性产线
3CEMS Group visited the flexible production line of SVV group under the organizer



李消非：流水线

李消非来自湖南，毕业于广州美术学院油画系，目前居住在上海、纽约。李消非从2010年开始创作“流水线项目”，该项目是一种与当下的社会进程和社会变迁联系在一起的实践过程，至2018年他已在世界各地考察和拍摄了二百多家不同类型的工厂。他用重复不断的运行和递进的影像来代替一般叙事手法去感知生产者，以探讨工业生产和社会发展的关系，并不断质疑视觉生产和商品生产之间的问题。

流水线系列作品影像截图



Li Xiaofei: Assembly Line

Li Xiaofei is from Hunan, graduated from the Oil Painting Department of Guangzhou Academy of Fine Arts. Now he lives in Shanghai and New York. Assembly Line Project is a practice that connecting the current socialization course and social transition. Until 2018, Li has observed and shot more than 200 factories around the world. Li uses the constantly running and progressive videos to replace the common narration mode to perceive the producer and the manufacturer with the purpose that discusses the relationship between industrial manufacture and social development as well as the problem brought by the visual manufacturing and the goods manufacturing.



A Woman Director, No.4



A Foreign Boss, No.4



A Department Manager, No.2



A Printer, No.8

新闻集锦 Industrial News

编辑&整理: Urbanus

NASA首次公布经济成绩单：2019年为全社会创造643亿美元价值 养活31.2万人

美国国家航空航天局（NASA）本周公布了一份长达2670页的经济产出报告，这也是该机构有史以来首次向社会公开顶级航空机构的经济价值。该报告显示2019年NASA的平民雇员一共有1.8万名，而在美国经济中每一个NASA雇员背后都有17个位于产业链的岗位为其提供支持，与该机构密切相关的全职岗位人数因此达到31.2万人

NASA commissions report to show its economic impact: \$64B and 312K jobs

NASA has released its first-ever agency-wide economic report, documenting the agency's impact on the nation's jobs and cash flow. Everyone knew NASA was impactful, but now we know exactly how impactful it is, some \$64 billion and more than 300,000 jobs' worth in FY2019.



Read more:
<https://bit.ly/30gBDUV>



Read more:
<https://bit.ly/3hZtUAh>

融合两大产业，中国汽车芯片产业创新战略联盟成立

9月19日，由国家科技部、工信部共同支持，国家新能源汽车技术创新中心牵头发起的“中国汽车芯片产业创新战略联盟”（简称“中国汽车芯片创新联盟”）在北京正式成立。有包括整车企业、汽车芯片企业、众多汽车电子相关供应商和高校、行业组织等 70 余家企事业单位参与了联盟。

New Alliance Formed In China To Promote Self-Sufficiency In Automotive Chips

The China Automotive Chip Industry Innovation Strategic Alliance was officially established in Beijing on September 19, which is jointly supported by the Ministry of Science and Technology and the Ministry of Industry and Information Technology of China, and led by the China New Energy Vehicle Technology Innovation Center.

三星和SK海力士停供华为

韩国业内有关人士表示，美方上个月17日宣布新政策后，“（韩企）从当天起就已停止生产向华为供应的半导体。”但由于半导体生产工序的特性，允许在9月14日前向华为销售已投入工序制造的产品，从9月15日起，只有经过美国批准方可向华为销售。

Samsung Reportedly Cutting Off Chip Sales to Huawei

Samsung and SK Hynix will reportedly stop selling components to Huawei as the Trump administration tightens sanctions on the Chinese phone maker. According to Chosun Ilbo and other Korean news outlets, the companies will suspend trade on September 15th, the day a new set of rules limits dealing with Huawei.



Read more:
<https://bit.ly/3mDCc4u>

车电分离推进或加速：能否开启产业链的新世界？

近日，中国汽车工业协会、中国汽车动力电池产业创新联盟、中国电动汽车充电基础设施促进联盟联合车企和汽车零部件供应商等共计20家单位签署《构建新能源汽车“车电分离”模式生态圈联合声明》，车电分离生态圈正式成立。而另一方面，工信部在近期内部研讨会上表示将鼓励企业开展换电技术的研发，支持各地试点车电分离模式，并动员地方制定相关产业政策，促进新能源汽车的发展。在行业和政府的双重推动下，车电分离模式或将迎来前所未有的发展机遇。

China's Electric Car Battery Swap Model Expected To Open A Huge Market

Recently, 20 Chinese companies and organizations signed the Joint Declaration on Building an Eco-circle for the "Body-to-Battery Separation" Model of New Energy Vehicles, marking the official establishment of the body battery separation eco-circle.



Read more:
<https://bit.ly/3iVLRBg>



Read more:
<https://bit.ly/3iVM8Ei>

未来2到3年，中国制造业仍然主导全球

在不断升级的中美贸易摩擦影响下，制造业产业链正在不断撤离中国。不过据业内人士透露，未来2到3年，中国会继续主导全球的制造业，尤其是对台湾的制造业来说更是如此。现阶段对于构建所谓的“G2”中美两套供应链体系仍然有许多的不确定性。另外，在新的国家发展产能也不是一件容易的事情。消息人士称，这也促使许多制造商在生产部署上考虑到灵活性。

China To Stay As Major Manufacturing Base In Next 2-3 Years

Manufacturers are leaving China amid intensifying trade disputes between Beijing and Washington, but the Asian giant will continue to dominate manufacturing operations in the next 2-3 years, especially for Taiwanese manufacturers, according to industry sources.

3CEMS GROUP



3CEMS Group致力为合作伙伴们提供一条龙电子制造代工服务,从印刷电路板、代工带料、供应链管理、**PCBA**、整机组装、系统组装/整合服务的完整电子制造解决方案,并且专注于消费电子、通信电子、医疗电子、汽车电子、工业电子、以及海事电子相关电子产品的制造与生产。目前集团服务伙伴遍及北美、欧洲与亚洲知名一级品牌集团企业。

3CEMS Group is your trusted electronic manufacturing services provider. We offer our customers an all-in one solution from PCB, PCBA to completed Box-Build, System Build/Integration and Join Design services. Specializing in the fields of computer peripherals, communications, medical, automotive, industrial and maritime electronics enterprise, we have partnered with many Tier-1 brand names from North America, Europe and Asia.

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