

# ENERGY

---

WeChat Official Accounts / 微信公众号: 麦肯息讯报告

*Vol.154,2016*

- oil
- natural gas
- wind
- solar
- biofuels
- ore
- coal
- electricity
- water
- nuclear energy
- new energy



扫一扫 了解更多

Scan For More Information

**Mcanxixun Information and News Service**

# Contents

<b>Oil (石油)</b> .....	<b>3</b>
China's oil majors scale back output as priorities shift.....	3
中石油和中石化双双减产 .....	4
Chinese 'teapot' refineries brew co-ordinated crude sourcing.....	4
中国独立炼油厂拟抱团采购原油 .....	5
Saudis and Russia eye oil co-operation .....	6
沙特和俄罗斯宣布联手维稳油价 .....	7
<b>New Energy (新能源)</b> .....	<b>7</b>
New energy blueprints by utility giants face market test.....	7
实业巨头的新能源蓝图面临市场考验 .....	8
ReneSola hit by slowing China demand and wafer margin squeeze .....	9
昱辉阳光遭遇中国需求放缓及硅片利润挤压的打击.....	12
India's Odisha awards 270MW in 'pruned' solar auction.....	15
印度奥里萨邦在“削减的”太阳能拍卖中授予 270MW .....	15
India releases draft regulation for testing solar equipment quality .....	16
印度发布法规草案用于测试太阳能设备质量.....	16
Brazil government open to dialogue after currency slump hits energy projects .....	17
巴西政府在货币暴跌打击能源项目后开放对话.....	17
France launches 3GW solar tender .....	18
法国推出 3GW 太阳能招标.....	18
European energy M&A market likely to be hit by Brexit impact, EY warns .....	19
欧洲能源并购市场可能受到英国脱欧影响的打击.....	19
<b>Natural Gas (天然气)</b> .....	<b>20</b>
As Japan and South Korea import less LNG, other Asian countries begin to import more .....	20
日本和韩国进口液化天然气减少，其他亚洲国家液化天然气进口增多.....	22
BP strikes new shale deal in China .....	23
BP 与中石油达成第二份页岩气合同.....	24
Natural gas generation and electricity imports used to follow load in California.....	24
加利福尼亚的天然气发电和电力进口量.....	27
<b>Minerals (矿产)</b> .....	<b>29</b>
Mystery Myanmar mines shake up world tin market .....	29
缅甸搅动全球锡市场 .....	30
LME owner to launch China trading platform.....	31
港交所明年在内地推金属交易平台 .....	32
<b>Clean Energy (清洁能源)</b> .....	<b>32</b>
UK Tories wake up to nuclear folly, as wind and solar found to be cheapest.....	33

## Mcanxixun Information

---

英国保守党认识到核能的愚行 .....	34
North Korea conducted fifth nuclear test, says South Korea .....	35
朝鲜实施第五次核试验 .....	36
Koreans near investment in new Cumbrian nuclear plant .....	36
韩国电力接近参与英国新核电项目 .....	37
Theresa May to consult security experts over UK's Hinkley decision .....	37
英首相针对中资参与核电项目咨询安全顾问 .....	38
China and the US to ratify the Paris deal ahead of G20 .....	39
中美两国将在二十国峰会前批准《巴黎气候协议》 .....	40
Fossil fuel subsidies are the biggest obstacle to low-carbon transition .....	41
棕色补贴是可持续发展的“最大阻碍” .....	42
Big push to "green" China's data centres .....	43
中国大型数据中心：节能节水势在必行 .....	44
<b>Coal（煤炭） .....</b>	<b>46</b>
Global coal plant pipeline slashed in past year .....	46
去年全球燃煤电厂管道大幅削减 .....	52
Coal consumption by U.S. educational institutions has declined by 64% since 2008 .....	59
自 2008 年以来，美国教育机构的煤炭消费量下降了 64% .....	61
The Challenge of Cutting Coal Dependence .....	63
向燃煤说再见，没那么容易 .....	64
Pakistan's coal expansion brings misery to villagers in Thar desert .....	66
巴基斯坦扩大煤炭开采让塔尔沙漠村民痛苦连连 .....	68
<b>Electricity（电力） .....</b>	<b>70</b>
Canadian Solar using power plant projects as buffer to falling module demand and ASP's .....	70
阿特斯阳光电力利用发电站项目作为缓冲 .....	72
Recurrent Energy's 100MW Mustang Solar Project reaches commercial operation .....	73
Recurrent Energy 的 100MW Mustang 太阳能项目实现商业运营 .....	73
Yingli Green's solar module shipments set to plummet in Q3 .....	74
英利绿色能源第三季度太阳能组件出货量或暴跌 .....	75
Conergy to build large-scale solar-plus-battery project in Australia .....	75
Conergy 拟在澳大利亚建设大型太阳能加电池项目 .....	76

## Oil (石油)

### **China's oil majors scale back output as priorities shift**

A shift in Beijing's priorities away from production targets has allowed Chinese oil companies to halt output in maturing oilfields, a previously politically unpalatable decision that leaves them better placed for an eventual recovery in oil prices.

International majors routinely scale back production from high-cost fields when oil prices fall, but in China, for decades, the government mandate has been to increase domestic supply and ensure energy security.

"In years past, they were under pressure to produce higher numbers every year, even if they were producing uneconomically. Now that pressure is gone," said Laban Yu, head of Asian energy research with Jefferies.

In the past week both PetroChina and Sinopec reported declines in oil production for the first half of the year. Sinopec said domestic crude oil output fell 13 per cent versus a 3 per cent drop in its overseas operations, while PetroChina reported a 4 per cent decline in domestic production.

Both managed to turn a profit in the first half, though PetroChina just barely remained in the black, reporting a 98 per cent plunge in first-half net profit to Rmb531m (\$79m) while revenue fell 16 per cent to Rmb739bn. Sinopec, whose refining arm benefits more from low crude prices, said net profit declined 22 per cent to Rmb20bn as revenues fell 37 per cent to Rmb880bn.

China's third oil major Cnooc, which had told analysts it would likely cut output by as much as 5 per cent this year, said oil and gas production crept up by less than 1 per cent in the first half and is expected to see crude output fall in the second half of the year. The company lost Rmb7.74bn in the first half, reversing from a profit of Rmb14.73bn a year ago.

In the first seven months of the year, Chinese crude oil output dropped 5 per cent compared with the same period of 2015, with production in July falling to levels last seen in late 2011.

That comes as refinery expansions and relaxed regulations on independent "teapot" refineries importing crude oil has turned China into a net exporter of oil products, easing Beijing's fears of an oil supply shortage.

"The language from Sasac has changed," said Thomas Hilboldt, head of energy research for Asia at HSBC, referring to the State-owned Assets Supervision and Administration Commission, which is in charge of state-owned companies. "The top-down guidance is no longer targeting production thresholds but supply thresholds."

"In simple terms, if all-in oil production costs are \$50 to \$60 a barrel to get oil out of the ground, and it can be purchased in the marketplace for \$25, then you should just buy crude for \$25," he said

That marks a sea change for China, where increasing production year after year was the top political priority regardless of the cost. Low oil prices and a supply glut have given oil companies the mandate to shut maturing fields and reduce workforces, even in northeastern provinces and the coal heartland where unemployment is already a big problem.

"It's not likely that the oil companies would close down oilfields on a large scale, but certainly they would use the chance to close down those old oilfields that produce little but cost a lot to operate," said Zhu Chunkai, oil analyst at Chem99.com.

Cuts in high-cost production beginning in 2015 helped PetroChina and Sinopec stay profitable, said Mr Yu of Jefferies, adding "there was a lot of fat to cut".

### 中石油和中石化双双减产

北京方面降低对产量指标的注重，使中国石油企业得以停止开采成熟油田。这个以往在政治上行不通的决定将使它们处于更有利的地位，以迎接油价的最终复苏。

大型国际石油企业经常在油价下跌时缩减高成本油田的产量，但在中国，几十年来政府下达的任务是增加国内供应，确保能源安全。

“往年它们承受逐年提高产量的压力，即使这种生产在经济上不划算也在所不惜。现在这种压力消失了，”杰富瑞(Jefferies)亚洲能源研究主管 Laban Yu 表示。

过去一周，中石油(PetroChina)和中石化(Sinopec)都报告今年上半年石油产量下降。中石化表示，国内原油产量下降了 13%，而海外产量下降了 3%，而中石油报告国内产量下降 4%。

两家公司在上半年都实现盈利。尽管中石油勉强保持盈利，上半年净利润暴跌 98%，至 5.31 亿元人民币（合 7900 万美元），而营收下降 16%，至 7390 亿元人民币。中石化——其炼油部门从低油价中获得更多好处——报告净利润下降 22%，至 200 亿元人民币，营收下降 37%，至 8800 亿元人民币。

中国第三家大型石油企业中海油(CNOOC)此前告诉分析师，今年很可能减产高达 5%。该公司现在表示，上半年石油和天然气产量微升不到 1%，预计今年下半年原油产量将会下降。该公司在上半年亏损 77.4 亿元人民币，去年同期实现 147.3 亿元人民币利润。

今年头七个月，中国原油产量同比下降了 5%，7 月份产量降至 2011 年末以来未见水平。

与此同时，炼油设施扩建和对以进口原油为原料的独立“茶壶”炼油厂放松监管，使中国成为一个成品油净出口国，也缓解了北京方面对于石油供应短缺的担忧。

“国资委的措辞发生了变化，”汇丰(HSBC)亚洲能源研究主管托马斯·希尔伯特(Thomas Hilboldt)表示。他指的是负责国有企业的国务院国有资产监督管理委员会(SASAC)。“自上而下的指导不再瞄准产量门槛，而是瞄准供应门槛。”

“简单来说，如果开采石油的全部成本是每桶 50 美元至 60 美元，而在市场上用 25 美元就可以买到，那么你就应该以 25 美元的价格买入原油，”他说。

这对中国是一个巨大变化；在中国，逐年提高产量而不计成本曾是最高政治任务。低油价和供应过剩使石油企业获得了在成熟油田停产和减少劳动力的授权，即便在失业已经是一大问题的东北省份和煤炭腹地也是如此。

“石油企业不太可能大规模关闭油田，但可以肯定它们会利用这个机会关闭那些产量很小、但作业成本很高的老油田，”卓创资讯(Chem99.com)石油分析师朱春凯表示。

杰富瑞的 Laban Yu 表示，2015 年启动的削减高成本生产的努力帮助中石油和中石化保持盈利。他补充说，“有大量脂肪可以切除”。

## Chinese ‘teapot’ refineries brew co-ordinated crude sourcing

A consortium of independent Chinese oil refineries trying to get out from under the shadow of powerful state-owned rivals has laid out plans for co-ordinated international crude sourcing, and exports of diesel and other oil products.

Independent refineries, known as “teapots”, account for about a fifth of China’s refining capacity and have been gaining market share since Beijing granted them crude import licences. But their eagerness to capitalise on the new clearance resulted in chaotic buying in the spring that led to severe port congestion and high storage charges

in China's northern province of Shandong.

The new consortium opens the door for more co-ordinated purchases and could help the teapots diversify their crude imports and lower their sourcing costs. It is led by Pacific Commerce, the Singapore-registered trading arm of Dongming Petrochemical, one of the largest of the teapots and which will represent the 16-strong group in international crude sourcing and product sales.

On Tuesday, Pacific Commerce signed an agreement on behalf of the group to source 8m barrels a year of crude oil through Unipec, the trading arm of state-owned Sinopec. The deal follows a similar agreement with UK oil major BP.

The structure of the consortium means that Dongming is shouldering the risk for its Shandong-based partners. The refineries are discussing taking shares directly in Pacific Commerce and setting up a bank-backed fund in Shandong to absorb some of the risk, a step that would strengthen the group's plans to trade oil as a unified block.

“We are all brothers. We know each other. None of us would endanger the others,” said Dongming vice-president Zhang Liuchang. “We can't ruin our credit because then the banks won't lend to us.”

The independent refiners have for years scraped by on spare domestic crude and imported fuel oil while facing official hostility. Their fortunes turned when they were issued crude import licences, and were able to buy higher-quality crude due to the glut in international markets.

However, the reprieve was threatened when the National Development and Reform Commission warned in August that it could revoke crude import licences for refiners that had not paid taxes. Various loopholes and complications in the Chinese tax code have in the past allowed teapots to avoid paying taxes on oil products refined from fuel oil.

“That will raise our costs but sooner or later we need to regularise ourselves,” Mr Zhang said.

The teapots' resurgence has had an impact beyond the domestic market, as they have contributed to a glut of diesel production in China that is pressuring middle distillate markets in Asia and as far away as the Middle East. Their licences to export refined products expire at the end of this year, another disadvantage versus the big state-owned companies.

To be truly a part of the international oil markets the independent refiners still need to convince global oil traders that they are creditworthy partners, especially after Baota Petrochemical, a teapot not part of the consortium, failed to get letters of credit last winter for \$50m of crude purchased from traders Vitol and Mercuria.

## 中国独立炼油厂拟抱团采购原油

由中国独立炼油厂组成的一个联盟公布相关计划，拟协调采购国际原油，并出口柴油等成品油。这些炼油厂正试图走出强大有对手的阴影。

被称为“茶壶”的独立炼油厂占中国炼油产能大约五分之一，自北京方面授予它们原油进口许可证以来，它们已扩大市场份额。但它们利用新获得的进口许可的急切心理在今年春季带来一波混乱的购买，在中国北方省份山东导致港口拥堵和高昂存储费用。

新的联盟为更加协调的采购打开了大门，可能帮助“茶壶”炼油厂分散原油进口来源，降低采购成本。该联盟由最大的“茶壶”之一太平洋商业控股有限公司（Pacific Commerce，东明石化(Dongming Petrochemical)在新加坡注册的交易部门）牵头，并将由其在国际原油采购和成品油销售中代表联盟中的逾16家集团。

周二，太平洋商业控股代表该联盟签署了通过国有的中石化(Sinopec)旗下交易部门联合石化(Unipec)每年进口800万桶原油的协议。此前该联盟与英国大型石油公司BP达成一个类似的协议。

该联盟的结构意味着东明为其山东合作伙伴肩负风险。这些炼油厂正在讨论直接入股太平洋商业控

## Mcanxixun Information

---

股，并在山东设立一只银行支持的基金，以吸收一些风险，此举将加强该联盟作为一个统一实体交易石油的计划。

“我们都是兄弟。我们互相认识。我们中没有人会危害其他人，”东明石化副总裁张留成表示，“我们不能破坏自己的信用，因为那样银行就不会借钱给我们。”

这些独立炼油厂苦撑了多年，依靠国内富余原油和进口燃料油维持经营，还要面对官方的敌视。获得原油进口许可证让它们时来运转，利用国际市场的供应过剩买到更高品质的原油。

然而，国家发展和改革委员会(NDRC)在 8 月警告称，尚未缴纳税款的炼油厂可能被吊销原油进口许可证，使这一局面受到威胁。以往，中国税法中的各种漏洞和复杂规定让“茶壶”得以规避为从燃料油提炼的成品油缴税。

“那将提高我们的成本，但我们迟早需要让自己规范化，”张留成表示。

“茶壶”炼油厂复苏所产生的影响已经超越国内市场，它们加剧了中国的柴油产量过剩，给亚洲甚至中东的中质馏分油市场带来压力。它们出口成品油的许可证将在今年底失效，这是它们相对于大型国有企业的另一个劣势。

要真正成为国际石油市场的一部分，这些独立炼油厂仍需要说服全球石油交易商相信，它们是守信用的合作伙伴，尤其是鉴于宝塔石化(Baota Petrochemical)——不属于这个联盟的一家“茶壶”炼油厂——去年冬天竟未能为其从维托尔(Vitol)和摩科瑞(Mercuria)两家交易商购买的 5000 万美元原油获得信用证。

## Saudis and Russia eye oil co-operation

Saudi Arabia and Russia yesterday said they would co-operate to try to stabilise oil markets, but stopped short of agreeing immediate action to restrict production and end a glut that has halved prices in the past two years.

Traders have been watching for signs the world's biggest producers could cap output when they meet in Algiers later this month, with some Opec members clamouring to shore up the price.

The energy ministers of Russia and Saudi Arabia, which together produce more than a fifth of the world's crude, said at the G20 meeting in China that they could limit output, while establishing a “working group” to explore other ways to reduce market volatility. Russia is the largest exporter outside of Opec.

“Freezing production is one of the preferred possibilities but it does not have to happen specifically today,” Saudi oil minister Khalid Al Falih said.

News of their planned co-operation initially sent prices shooting higher, with international benchmark Brent crude gaining as much as 6 per cent to \$49.40 a barrel.

But Brent quickly retraced most of its gains to trade nearer \$47 a barrel, after it became clear there was no concrete agreement.

The pact at the G20 followed a meeting between Mohammed bin Salman, Saudi deputy crown prince, and Russian President Vladimir Putin at the weekend. Greater co-operation has been under discussion for almost a year, but lower prices and Middle East geopolitics — each country supports opposing sides in Syria's civil war — is creating strain.

Russia was ready to join the cartel in freezing output in April before Saudi Arabia halted talks at the last minute, refusing to join any deal without the participation of its regional rival Iran.

Russia's energy minister Alexander Novak described yesterday's agreement as “historic” but tensions remained readily apparent.

While Mr Novak said an output cap was “the most effective instrument,” with details of a plan “currently being discussed”, Mr Falih suggested freezing production may not be necessary.

The Russian minister also said a production deal may not have to include Iran until Tehran's production had recovered to pre-sanctions levels. Mr Falih said he believed, however, that Iran's output was already at that level.

## 沙特和俄罗斯宣布联手维稳油价

两国能源部长在 G20 会议上表示，他们将考虑限制石油产量，同时建立工作小组以探索减少市场波动性的方法。

沙特阿拉伯和俄罗斯昨日表示他们将联手试图稳定石油市场，但未能就限制产量、结束生产过剩状态——这导致油价过去两年下跌了一半——商定立即行动。

交易商正在留意世界各大产油国本月晚些时候在阿尔及尔开会时限制产量的迹象。石油输出国组织(OPEC)的某些成员国强烈要求支撑油价。

俄罗斯和沙特（这两国的原油产量超过世界总量五分之一）的能源部长在中国举行的 20 国(G20)会议上表示，他们可以限制产量，同时建立一个“工作小组”来探索减少市场波动性的其他方式。俄罗斯是 OPEC 以外最大的石油出口国。

“冻结产量是优先考虑的可能性之一，但是不一定非要在今天出台，”沙特石油部长哈立德·阿尔-法立赫(Khalid al-Falih)表示。

他们宣布合作计划的消息起初使得油价上涨，国际基准的布伦特(Brent)原油价格上涨 6%，至 49.40 美元/桶。

但是，随着没有达成具体协议的事实变得明朗，布伦特原油价格很快回落至 47 美元/桶左右，抹掉了大部分涨幅。

在 G20 峰会上达成协议之前，沙特副王储穆罕默德·本·萨勒曼(Mohammed bin Salman)和俄罗斯总统弗拉基米尔·普京(Vladimir Putin)周末会晤。两国之间对于扩大合作已经讨论了近一年，但是油价下跌和中东地缘政治——两国在叙利亚内战中支持着对立的阵营——正在制造紧张。

4 月，俄罗斯曾准备好与该组织一起冻结产量，但沙特在最后时刻停止了对话、拒绝在没有区域竞争对手伊朗参与的情况下加入任何协议。

俄罗斯能源部长亚历山大·诺瓦克(Alexander Novak)形容昨天的协议“具有历史意义”，但是紧张局面仍然显而易见。

尽管诺瓦克称设置产量上限是“最有效的工具”、计划细节“目前正在讨论之中”，但是法立赫暗示冻结产量或许没有必要。

诺瓦克还表示，在德黑兰方面的产量恢复到制裁前水平之前，生产协议可能不一定要包括伊朗。然而法立赫称，他认为伊朗的石油产量已经达到那个水平了。

## *New Energy* (新能源)

### **New energy blueprints by utility giants face market test**

In reporting annual first-half results last week, Europe's two biggest utilities offered some hints of the strategies in which they have created new units to separate newer energy assets from older ones.

At both E.ON and RWE, the newest energy units are built around renewable power, grid networks and retail sales, separate from fossil fuel energy and trading, to target growth markets. The goal at both companies is to establish more stable, regulated revenues (renewables are often supported by government subsidies, and grid networks earn

## Mcanxixun Information

---

regulated returns).

But there are big differences in what the two companies are doing. E.ON is spinning off its conventional energy assets, now called Uniper, and plans to exit those completely over time. RWE will separate out its new business, now called innogy, although it will retain a large majority stake.

The tactics raise two questions. First, how deep-rooted are the changes? And second, what will investors will make of them?

Both RWE and E.ON had missed the boat on renewables, until now at least. Of some 200 gigawatts (GW) of installed renewable power capacity in Europe, E.ON has only 2.1GW and RWE 3.1GW.

Both ventures are saddled with legacy debt. E.ON has a chunky “net economic debt” burden at 3.7 times pre-tax earnings or EBITDA. RWE is targeting a net debt/EBITDA ratio of 4 for innogy.

Both companies retain some conventional assets and/or German nuclear liabilities. These holdings continue to be a drag on earnings. E.ON, for example, on Wednesday reported new Uniper provisions of €3.8 billion, including a €1.5 billion write-down on just two power plants (E.ON wouldn’t divulge which plants those were, saying only that they were both conventional assets outside Germany).

Going forward, E.ON, even after it exits its last shares in Uniper, will retain its legacy nuclear business, which comes with substantial pay-outs for waste disposal and continuing liabilities for decommissioning.

Unlike E.ON, RWE plans to keep its conventional assets. That may be trouble down the road. In its first-half results published on Thursday, RWE emphasized its commitment to lignite mining beyond 2030, and “the importance of domestic lignite over the long term for ensuring a secure and affordable energy supply.” This despite the fact that lignite is the most polluting and highest carbon-emitting form of fuel—in a time in which such fuel is fast falling out of favor.

We will see soon enough what investors make of it all.

While the strategic motivation for both companies is to get into high-growth markets in digital, centralized energy networks and generation, the immediate bottom-line motive is to raise cash through higher valuation, whether in new or old assets or both. E.ON floats Uniper next month, and RWE issues shares in innogy at the end of the year.

Investors may remember that other European utilities that include EDF, Iberdrola and Enel have all hived off minority stakes in their green energy businesses in the past, at attractive valuations, only to buy them back at a discount. The parent companies always kept control, and were ultimately the biggest winners. If investors didn’t make money then, they may be more cautious this time around.

For E.ON, a low valuation of Uniper will force it to take further write downs, as it said in its first-half results this week. “If the stock-market listing of Uniper SE results in a market valuation that is below the Uniper Group’s proportional net assets, E.ON SE would have to record an impairment charge.”

Meanwhile RWE is issuing shares in only 10, and so the amount of cash it raises, either way, may be limited.

## 实业巨头的新能源蓝图面临市场考验

在上周的年度上半年业绩报告中，欧洲的两个最大的实用商提供了一些战略迹象，他们已经创造了新的部门，以将新的能源资产和旧的分离。

在 E.ON 和 RWE，最新的能源部门主要基于可再生能源发电、电网和零售销售建立，与化石燃料能源和贸易分开，目标是市场增长。这两家公司的目标都是建立更稳定、更规范的收入（可再生能源通常是由政府补贴支持，电网赚取规范回报）。

但这两家公司正在做的事情有很大的不同。E.ON 公司正在剥离其常规能源资产，现在称为 Uniper，并计划一段时间完全退出。RWE 将分离出的新业务，现在叫 Innogy，尽管它将保留大部分股权。

策略提出了两个问题。首先，变化有多根深蒂固？第二，投资者将如何利用它们？

RWE 和 E.ON 都错过了对可再生能源的船，至少直到现在是这样。在欧洲约 200 吉瓦（GW）的可再生能源发电装机容量，E.ON 只有 2.1GW，RWE 只有 3.1GW。

这两家企业都背负着历史遗留下来的债务。E.ON 有沉重的“净经济债务”负担，是税前 3.7 倍或 EBITDA。RWE 的目标是 Innogy 的净债务/EBITDA 4 倍比率。

两家公司保留一些传统的资产和/或德国的核负债。这些持股继续拖累盈利。E.ON，例如，星期三公布的新 Uniper 38 亿欧元所有，包括两电厂 15 亿欧元的减值（E.ON 公司不愿意透露这些电厂是哪些，只说他们都是德国以外的传统资产）。

展望未来，E.ON，甚至在 Uniper 只有最后一股，也将保留其传统的核心业务，而大量的支出用于废物处置及持续负债。

与 E.ON 不同的是，RWE 计划保留其传统的资产。这可能是道路上的麻烦。在其星期四公布的上半年结果中，RWE 强调褐煤开采的承诺超过 2030 年，和“国内褐煤长期确保安全和负担得起的能源供应的重要性。”尽管褐煤是污染最严重的和最高的碳排放燃料的形式—在这段时间中这样的燃料很快失宠。

我们很快就会看到投资者所利用的一切。

虽然这两个公司的战略动机是进入数字化高增长的市场，集中能源网络和发电，直接的底线动机是通过更高的估值来提高现金，无论是在新的或旧的资产或两者。E.ON 下个月漂浮 Uniper，年底 RWE 在 Innogy 发行股票。

投资者可能还记得，其他欧洲公用事业，包括 EDF，Iberdrola 公司都把过去在他们的绿色能源企业的少数股份分出来，以具有吸引力的价格估值，只以折扣价买回来。母公司总是保持控制，并是最大的最终赢家。如果投资者当时没有赚钱，那么这一次他们可能会更谨慎。

对于 E.ON 来说，Uniper 的低估值会迫使其采取进一步的减值，如同其本周在其上半年业绩中所说，“如果 Uniper SE 股市导致市场估值低于 Uniper 集团的比例净资产，E.ON SE 会记录减值费用。”

同时 RWE 只以 10 发行股票，所以无论哪种方式提出现金数额，可能都是有限的。

## **ReneSola hit by slowing China demand and wafer margin squeeze**

Solar wafer and module manufacturer ReneSola reported second quarter 2016 results impacted by a module end market demand slowdown in China and high polysilicon prices, while wafer ASP's decline, squeezing revenue and margins.

ReneSola reported second quarter 2016 wafer shipments of 423.3MW compared with 351MW in the previous quarter, a 20.6% increase quarter-on-quarter and up 50%, year-on-year.

However, wafer ASPs started falling in the quarter after the rush to complete downstream PV projects before the end of June rescinded.

Margins fell as a result, compounded by continued strength in polysilicon process in China on tight supply, due to high import tariffs for primarily US polysilicon suppliers, severely limiting imports.

Renesola management noted in its earnings call that wafer ASPs were falling by around 20%, yet expected prices to start stabilising in September on demand pick-up, while polysilicon prices could finally start to fall on weaker demand in the fourth quarter of 2016.

External module shipments continued to decline since the third quarter of 2015, primarily to Renesola's continued strategy to reduce module shipments to third parties and focus on its downstream project business. Module shipments were 282.4MW in the quarter, down 19.5% from the first quarter of 2016 and down 12.3% from the

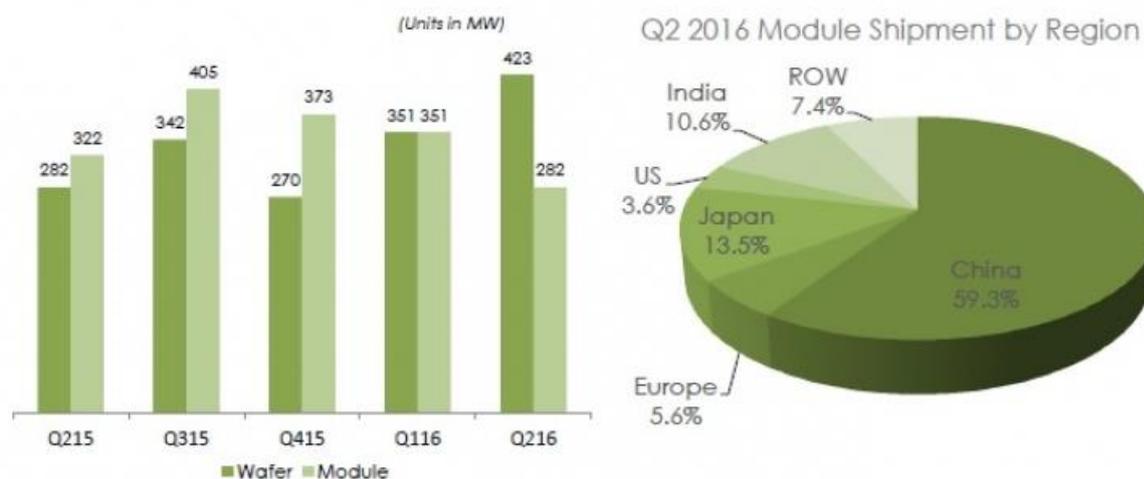
## Mcanxixun Information

second quarter of 2015.

Management also noted that module ASP's were expected to decline by 20% in the third quarter.

With weaker demand, declining ASPs and a margin squeeze, Renesola guided third quarter revenue to be down to around US\$200 million and margins falling to around 10%. As a result, full-year revenue would be in the range of US\$900 million to US\$1.1 billion, compared with previous guidance of US\$1.0 billion to US\$1.2 billion.

### Q2 2016 Wafer and Module Shipments



- ◆ Q2 module ASP up modestly to \$0.53 / watt
- ◆ Strong sequential volume growth for wafer

**ReneSola**

ReneSola reported second quarter 2016 wafer shipments of 423.3MW compared with 351MW in the previous quarter, a 20.6% increase quarter-on-quarter and up 50%, year-on-year.

#### Financials

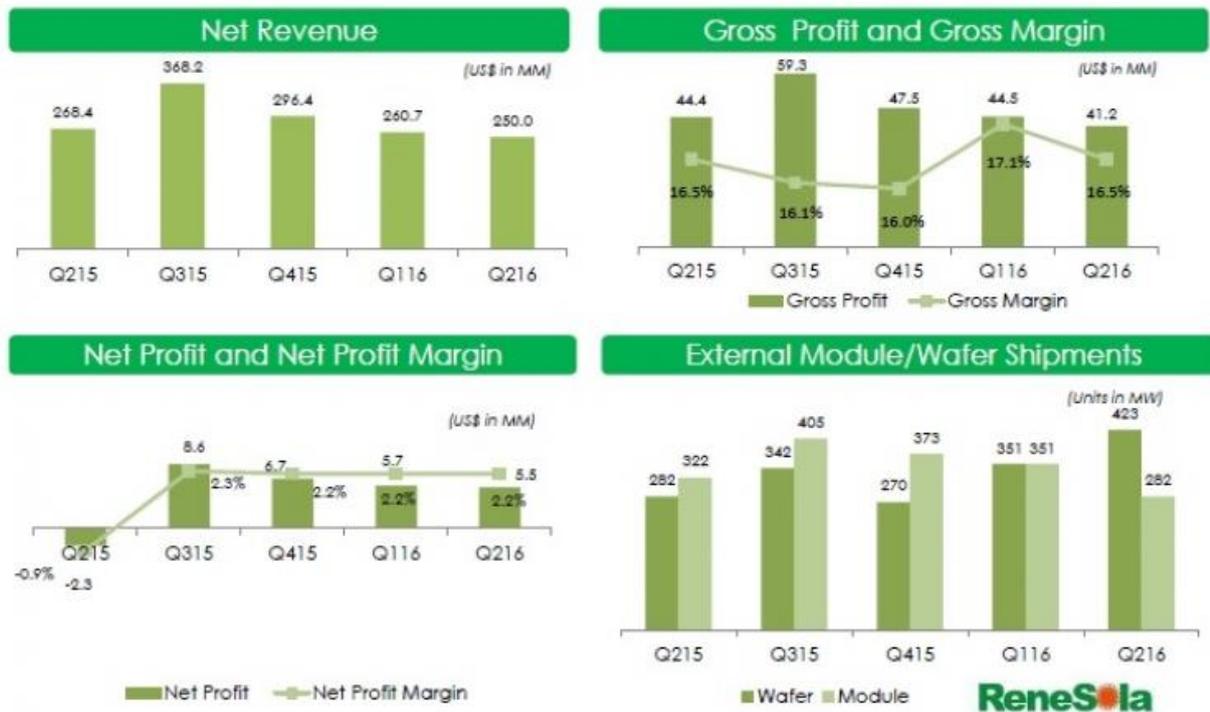
ReneSola reported second quarter 2016 revenue of US\$250.0 million, compared with guidance range of US\$280-\$290 million.

Gross profit in the quarter was US\$41.2 million, down 7.5% from the previous quarter. Gross margin was 16.5%, compared with 17.1% in the previous quarter. Net income was US\$5.5 million, compared with US\$5.7 million in the previous quarter.

Xianshou Li, ReneSola's chief executive officer said: "Although total revenue was below guidance due to recognition timing of the four UK projects sold during the quarter, we believe we should benefit from that revenue as well as the potential sale of another six UK projects in the second half of the year. Our strong project monetization outlook and continued growth in the high margin LED initiative give us confidence in our ability to transition from manufacturing business toward project development and distribution business."

Renesola reported cash and cash equivalents stood at US\$163.4 million at the end of the second quarter, down from US\$190.0 million at the end of Q1 2016.

## Historical Performance Trends



5

ReneSola reported second quarter 2016 revenue of US\$250.0 million, compared with guidance range of US\$280-\$290 million.

### PV projects

Renesola noted that its PV project pipeline had increased significantly in the quarter, reaching 938MW, which included 918MW of PV projects, across China, Japan, Thailand, Turkey, North America and Europe.

The company connected six utility-scale projects to the UK grid during the quarter with total capacity of approximately 26MW and expects the projects to be sold in the third quarter of 2016.

Aside from the UK market, ReneSola noted the strength of its project plans in the US and Canada. In the US the company has a 170MW pipeline of projects.

“You’re all probably aware that conditions in the solar industry are challenging. Accordingly, we’re operating conservatively going into the second half of the year. Demand is slowing in most regions of the world pressuring sales growth and margins.

At this point in the quarter, we can see the slowdown quite clearly in China and other regions. Our strategy has always been to keep the company stable in tougher times and strive in good times. Again, we intend to be flexible and resilient as the industry cycles through a sluggish period in the next couple of quarters,” added Li from translated prepared comments in the earnings call.

## High Quality Project Pipeline

- ◆ Mix of renewable sources with heavy emphasis on solar
- ◆ Geographically diversified among stable jurisdictions
- ◆ Attractive IRRs

Solar Projects		
Country	Size (MW)	Late-Stage Projects of Total Pipeline (MW)
USA	169.6	107.8
UK	250.2	45.3
Canada	32.3	9.0
Japan	31.5	29.6
Poland	120.0	
Turkey	116.0	116.0
Spain	75.0	
Thailand	50.0	
France	38.6	0.1
China DG	35.0	16.0
<b>Total</b>	<b>918.2</b>	<b>323.8</b>

Wind Projects		
Country	Size (MW)	Status
Poland	20	Early-to-Mid-stage Project



The company connected six utility-scale projects to the UK grid during the quarter.

### 昱辉阳光遭遇中国需求放缓及硅片利润挤压的打击

太阳能硅片和组件制造商昱辉阳光(NYSE:SOL)报告，2016 年第二季度业绩受到中国组件终端市场需求放缓以及多晶硅价格高，而硅片的平均销售价格下降、收入和利润受到挤压的影响。

昱辉阳光报告，2016 年第二季度硅片出货量为 423.3MW，而上季度为 351MW，季度同比提高 20.6%，年同比提高 50%。

然而，在六月底前急于完成下游光伏项目后，该季度硅片平均销售价格已经开始下降。

结果是利润下降，并且由于对美国主要多晶硅供应商的高进口关税，严重限制进口，中国多晶硅的供应紧张持续加强。

昱辉阳光管理层在其收入电话会议中指出，硅片平均销售价格下降约 20%，然而预计九月由于需求回升价格开始稳定，同时由于 2016 年第四季度需求减弱，多晶硅价格可能最终开始下降。

自 2015 年第三季度以来，对外组件出货量持续下降，主要是昱辉阳光减少对第三方的组件出货量，以及专注于其下游项目业务的持续战略。该季度组件出货量为 282.4MW，较 2016 年第一季度下降 19.5%，较 2015 年第二季度下降 12.3%。

管理层还指出，预计第三季度组件平均销售价格将下降 20%。

鉴于需求疲软，平均销售价格下降以及利润挤压，昱辉阳光预计，第三季度收入将降至两亿美元左右，利润率降至 10%左右。因此，全年收入将为九亿美元至十一亿美元，而此前目标为十亿美元至十二亿美元。

#### 财务业绩

昱辉阳光报告，2016 年第二季度收入为 2.5 亿美元，而目标为 2.8 亿美元至 2.9 亿美元。

该季度毛利润为四千一百二十万美元，较上季度下降 7.5%。毛利率为 16.5%，而上季度为 17.1%。净

收入为五百五十万美元，而上季度为五百七十万美元。

昱辉阳光首席执行官李仙寿表示：“尽管由于该季度确认四个英国项目出售的时机，使总收入低于目标，但是我们相信，今年下半年我们应该获益于该收入以及另外六个英国项目的潜在出售，我们强劲的项目盈利前景以及高利润的 LED 举措的持续发展，使我们相信我们有能力从制造业务向项目开发和分销业务转移。”

昱辉阳光报告，第二季度末现金和现金等价物为 1.634 亿美元，较 2016 年第一季度末 1.9 亿美元有所降低。

光伏项目

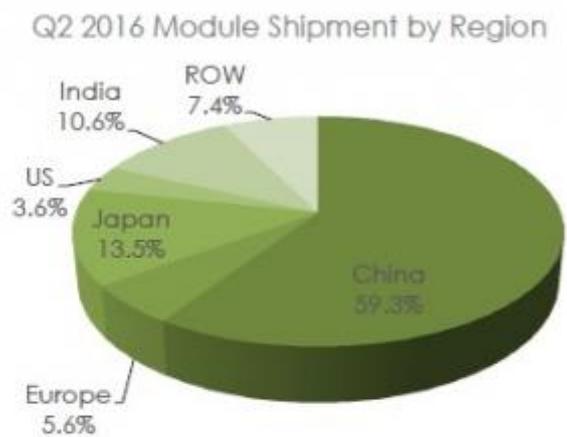
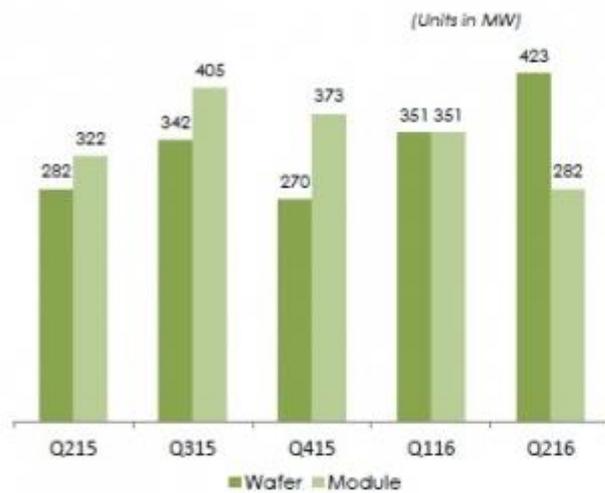
昱辉阳光指出，该季度其光伏项目储备大幅增长，达到 938MW，其中包括 918MW 的光伏项目位于中国、日本、泰国、土耳其、北美和欧洲。

该季度该公司向英国电网并网六个公共事业规模项目，总装机容量约 26MW，预计将于 2016 年第三季度出售这些项目。

除了英国市场，昱辉阳光指出，其在美国和加拿大的项目计划强劲。在美国，该公司拥有项目储备 170MW。

李仙寿补充道：“你可能意识到，太阳能行业的状况富有挑战。据此，我们今年下半年谨慎运营。在世界大多地区需求放缓为销售增长和利润施加压力。该季度在这一点上，我们相当清楚地看到中国和其他地区的放缓，我们的战略一直是保持公司在艰难时期的稳定，在良好的时刻奋力发展。再次，由于未来几个季度行业进入萧条期，我们打算灵活并富有弹性地发展。”

Q2 2016 Wafer and Module Shipments



- ◆ Q2 module ASP up modestly to \$0.53 / watt
- ◆ Strong sequential volume growth for wafer



昱辉阳光报告，2016 年第二季度硅片出货量为 423.3MW，而上季度为 351MW，季度同比提高 20.6%，年同比提高 50%

Historical Performance Trends



5

昱辉阳光报告，2016年第二季度收入为2.5亿美元，而目标为2.8亿美元至2.9亿美元

High Quality Project Pipeline

- ◆ Mix of renewable sources with heavy emphasis on solar
- ◆ Geographically diversified among stable jurisdictions
- ◆ Attractive IRRs

Solar Projects		
Country	Size (MW)	Late-Stage Projects of Total Pipeline (MW)
USA	169.6	107.8
UK	250.2	45.3
Canada	32.3	9.0
Japan	31.5	29.6
Poland	120.0	
Turkey	116.0	116.0
Spain	75.0	
Thailand	50.0	
France	38.6	0.1
China DG	35.0	16.0
<b>Total</b>	<b>918.2</b>	<b>323.8</b>

Wind Projects		
Country	Size (MW)	Status
Poland	20	Early-to-Mid-stage Project

该季度该公司向英国电网并网六个公共事业规模项目

## India's Odisha awards 270MW in 'pruned' solar auction

Solar Energy Corporation of India (SECI) has awarded 270MW of solar PV capacity in the Indian state of Odisha to three firms.

The winners, who bid at a fixed tariff of INR4.43/kWh (US\$0.067) combined with viability gap funding (VGF) provided by SECI, were:

Developer	Capacity (MW)	VGF (INR)
Essel Green Energy	240	4.95 million
IBC Solar	20	4.925 million
Jyoti Infrastructure	10	4.915 million

Odisha originally planned a tender for 450MW under the National Solar Mission Phase-II Batch IV, but this was pruned down to 300MW and then reduced further to 270MW for the bidding process, Shailendra Bebortha, managing director of IBC Solar Projects, told PV Tech.

The VGF in this case will be paid on commissioning of the project in one transaction, which effectively reduces the capital cost of the project.

Bebortha said: "In terms of tariff it will translate to somewhere between 4.8 to 4.9 rupees per kilowatt hour."

He added: "In terms of competition it was low compared to other tenders we have seen in the market. In terms of number of participants and in terms of aggressiveness it was generally ok, not too good or too bad."

Some regions of Odisha have relatively good solar irradiation comparable to some other strong solar states.

Until last autumn IBC had concentrated on EPC services for projects in India, but its win in Odisha marks its first foray into the project development sector in India.

Yesterday SECI announced it is setting up a 'Payment Security Fund' to ensure that payments from Distribution Companies to solar developers are on schedule.

## 印度奥里萨邦在“削减的”太阳能拍卖中授予 270MW

印度太阳能公司(SECI)日前向三家公司授予位于印度奥里萨邦的 270MW 太阳能光伏装机容量。

获胜者，出价为每千瓦时 4.43 印度卢比(0.067 美元)的固定价格，结合 SECI 提供的可行性缺口融资 (VGF)，如下。

开发商	装机容量(MW)	VGF (印度卢比)
Essel Green Energy	240	495万
IBC Solar	20	492.5万
Jyoti Infrastructure	10	491.5万

IBC Solar Projects 的总经理 Shailendra Bebortha 在接受 PV-Tech 采访时表示，奥里萨邦原计划根据国家

## Mcanxixun Information

---

太阳能计划第二阶段第四批招标 450MW，但是被削减至 300MW，之后进一步削减至 270MW。

在这种情况下，在一次交易中一旦项目投产，将支付 VGF，这有效降低了项目的资金成本。

Bebortha 表示：“在价格方面，这将转化为每千瓦时 4.8 至 4.9 印度卢比。”

他补充道：“在竞争方面，较我们在市场上看到的其他招标，这较低。在参与者数量及积极性方面，其通常还好，不会太好也不会太坏。”

奥里萨邦一些地区的太阳能辐照较一些其他强劲的太阳能邦，相对较好。

直至去年秋，IBC 一直专注于印度项目的 EPC 服务，但是其在奥里萨邦获胜标志着其首次进军印度项目开发领域。

日前 SECI 宣布，其设立“付款保障基金”，以确保从配电公司到太阳能开发商的付款如期进行。

## India releases draft regulation for testing solar equipment quality

India is seeking to ensure the quality and reliability of solar PV equipment imported into the country, as per a draft technical regulation released by the Ministry of New and Renewable Energy (MNRE).

The draft regulation relating to solar systems, devices and components introduces performance testing and standardisation.

The MNRE is also working on a ‘Lab Policy’ for the renewable energy sector for such testing, standardization and certification.

Under the proposals, in order to sell, import or store solar equipment, PV manufacturers will have to make an application to the Bureau of Indian Standards (BIS) to obtain registration for use of a “Standard Mark”, which is the BIS certification mark.

Authorities will also have the power to call for information from the manufacturers of solar products and samples of products will be drawn from randomly selected locations at least once every two years.

Manufacturers may then be issued “directions” on the back of the tests. Substandard or defective goods that are not compliant with standards will also be scrapped.

The draft was prepared following a consultation of the Bureau of Indian Standards. Comments on the proposals are sought by 6 September.

In May, members of India’s solar industry spoke out against alleged “unregulated” imports of Chinese solar and wind energy equipment to India.

### 印度发布法规草案用于测试太阳能设备质量

依据新能源和可再生能源部(MNRE)发布的一份技术法规草案，印度正寻求确保进口到该国的太阳能光伏设备的质量和可靠性。

该关于太阳能系统、设备及部件的法规草案引入性能测试和标准化。

MNRE 还致力于针对可再生能源领域的一项“实验室政策”，进行测试、标准化和认证。

根据建议，为了销售、进口或储存太阳能设备，光伏制造商将必须向印度标准局(BIS)提出申请，注册以使用“标准标志”，这是 BIS 的认证标志。

当局还将有权要求获得太阳能产品制造商的信息，以及至少两年一次从随机选择的位置获取产品样本。

测试后制造商可以获得“指示”。不符合标准的不合格或残次商品也将作废。  
按照印度标准局的磋商准备该草案。将于九月六日寻求对于这些提议的评论。  
五月，印度太阳能行业成员公然反对所谓的中国太阳能和风能设备“不受管制”进口到印度。

## **Brazil government open to dialogue after currency slump hits energy projects**

Brazil's Ministry of Mines and Energy (MME) is proposing to allow solar developers that won projects in the 2014 auction to cancel them with a reduced penalty fee.

The proposal of 'amicable' cancellations, comes after developers were hit by a significant slump in the macroeconomic situation in Brazil and the ensuing difficulties with exchange rates, an industry source told PV Tech. Cancellations will still involve a penalty charge to make an example of companies that do not comply with their commitments. However, these penalties will be significantly reduced and "more realistic" from the current penalties written in the contracts.

Back in April, Canadian Solar, Renova Energia and four other unnamed developers wrote to Aneel, Brazil's national electrical energy agency, asking for more time to complete their projects from the 2014 auction, citing the market conditions as the reason for the request.

The government is now considering allowing cancellations in acknowledgement of this specific macroeconomic situation that followed the 2014 auction, but such actions will not affect projects won in the auctions of 2015 and 2016. For example, the ceiling prices for the 2015 auctions were adjusted as a result of the wider economic conditions.

### **Not just solar**

The announcement of this evaluation from MME secretary for planning and energy policy Eduardo Azevedo has been widely reported, but the industry source told PV Tech that solar is not the only technology to have been hit by the currency exchange ratio variations since 2014. For example, 2.5GW of gas-power plants contracted in 2014 are also under evaluation by the government as the company involved is not complying with some of the initial expectations of the government. Similarly, in the past year, auctioned projects involving other forms of renewable energy have had to be discussed and negotiated.

The source said this is a sign that the troubles are not exclusive to solar energy and the government appears to be open to discuss a genuine solution to a specific problem. Similarly, the government is showing capability of dialogue with the players in the face of a complex state of affairs that was very hard for the affected companies to predict.

### **Plans for 30-year contracts**

Azevedo has also said that government is considering lengthening solar power contracts from 20 to 30 years, in a move that may reduce the price of contracts in any auctions.

## **巴西政府在货币暴跌打击能源项目后开放对话**

巴西矿产能源部(MME)正提议允许在 2014 年拍卖中赢得项目的太阳能开发商取消这些项目，并且降低违约金。

一位业内人士在接受 PV-Tech 采访时表示，“友好”取消提议，在开发商遭遇巴西宏观经济形势显著低迷以及随之而来的汇率困境的打击之后到来。取消还将涉及罚款以警戒不遵守承诺的公司。然而，罚款

将大幅降低，较目前写入合同的罚款“更现实”。

早在四月，阿特斯阳光电力、Renova Energia 及四家其他不愿透露名称的开发商，致信巴西国家电力能源机构 Aneel，要求更多时间来完成从 2014 年拍卖的项目，援引市场情况作为该要求的原因。

政府目前正在考虑允许取消，承认在 2014 年拍卖后这一特定的宏观经济形势，但是这样的行动将不会影响在 2015 和 2016 年拍卖中赢得的项目。例如，2015 年拍卖的上限价格由于更广泛的经济状况而进行调整。

不只是太阳能

广泛报道了 MME 规划和能源政策秘书 Eduardo Azevedo 的这一评估公告，但是该业内人士在接受 PV-Tech 采访时表示，太阳能并非自 2014 年以来遭受货币兑换比价变化打击的唯一技术。例如，由于涉及的公司不符合政府最初的一些预期，2014 年签约的 2.5GW 燃气发电站也在由政府评估。同样，去年，涉及其他形式可再生能源的拍卖项目必须重新讨论和协商。

该人士表示，这是一个标志，问题不仅仅局限于太阳能，政府似乎开放讨论一个特定问题的真正解决方案。同样，政府正显示出与面临复杂情势的参与者的对话能力，受影响的公司很难预测到复杂情势。

三十年合同规划

Azevedo 还表示，政府正在考虑将其太阳能发电合同从二十年延长至三十年，此举可能降低拍卖中的合同价格。

## France launches 3GW solar tender

France's Ministry of Environment, Energy and Sea is launching 3GW of solar PV tenders over a three-year period.

Energy minister Ségolène Royal plans to increase the country's current installed solar capacity from 6.7GW to 10.2GW by the end of 2018, and up to 20.2GW by 2023.

The capacity up for grabs will be divided into six sections of 500MW each, with six months between each tender, meaning projects will be commissioned between the years 2017 and 2020. The spreading out of tenders for the assurance and availability of manufacturers, installers and developers.

Bidders will be selected based on their competitiveness, carbon impacts and the environmental impacts of their proposed site location.

Successful developers will receive subsidy support in the form of "additional remuneration", as per announcements made in May this year.

French tender announcements in July also led to France being tipped to potentially become the biggest end-demand solar market in Europe.

Last year French developer Neoen installed the largest solar park in Europe standing at 300MW

## 法国推出 3GW 太阳能招标

法国环境、能源和海洋部正在推出 3GW 太阳能光伏招标，为期三年。

能源部长 Ségolène Royal 计划到 2018 年底将该国目前的太阳能安装量从 6.7GW 提高到 10.2GW，到 2023 年提高至 20.2GW。

供争夺的装机容量将分为六个部分，各 500MW，每次招标之间六个月，意味着项目将在 2017 到 2020 年间投产。招标的展开为制造商、安装商和开发商提供担保和可用性。

将根据投标者的竞争力、碳影响以及他们拟议的电站位置对于环境的影响来进行选择。

根据今年五月发布的公告，成功的开发商将以“额外报酬”的形式获得补贴支持。  
七月的法国招标公告还使得法国有望成为欧洲最大的终端需求太阳能市场。  
去年法国开发商 Neoen 在欧洲安装最大的太阳能园区，位于波尔多附近 Cestas，达 300MW。

## European energy M&A market likely to be hit by Brexit impact, EY warns

The European investment market for power generation assets is likely to be severely hit by the continuing impacts of the UK's Brexit vote, 'Big Four' consultancy EY has warned.

However clean energy assets backed by long-term power purchase agreements (PPAs) will remain of particular interest due to their ability to provide stable, long-term returns.

The sentiments were raised in EY's latest power transactions and trends report, updated for Q2 2016.

Within it, the consultancy has warned that until the UK's energy policy and position in the EU energy market becomes clearer, investors could be put off acquiring utility-scale energy generation assets, particularly those in the UK.

Since the British public voted to leave the European Union on 23 June there has been substantial uncertainty over how the country will engage with continental Europe and the wider European energy market.

The UK is linked to Europe through various interconnectors, and energy is traded with the continent through them. Various reports published prior to the vote discussed the possibility of tariffs being added to any imported energy, a practice which economics consultancy Oxera warned would add £140 million to household bills.

EY also warned of the "mixed" regulatory support renewables had been afforded across Europe. While France and Italy have backed solar and other clean generators with fresh targets and support frameworks, Germany and the UK in particular had withdrawn support.

The UK has tumbled down EY's Renewable Energy Country Attractiveness Index (RECAI) in successive quarters and at the last update occupied 11th position.

But while the outlook for renewable generators in general has been unfavourable, EY did however state that investors had been buoyed by the number of assets backed by long-term PPAs, which it said were able to provide stable, long-term returns.

Appetite for securing PPAs with the UK's operational solar farms has intensified in recent quarters with the wholesale energy price plummeting, driving interest from asset holders into reducing their exposure to such fluctuations.

Asset owners such as Foresight and Bluefield have pursued PPAs after wholesale energy prices dented their net asset values in the last year.

### 欧洲能源并购市场可能受到英国脱欧影响的打击

“四大”咨询公司 EY 日前警告，欧洲针对发电资产的投资市场可能遭受英国脱欧投票持续影响的严重打击。

然而，长期购电协议支持的清洁能源资产，由于能够提供稳定、长期回报，仍将令人特别感兴趣。在 EY 最新的电力交易和趋势报告中提出 2016 年第二季度最新情况。

其中，该咨询公司警告，投资者可能推迟收购公共事业规模发电资产，特别是在英国的发电资产，直

至英国能源政策和立场在欧盟能源市场逐渐明朗。

自从六月二十三日英国公投离开欧盟以来，对于该国与欧洲大陆及更广泛的欧洲能源市场的接洽方式，一直存在很大的不确定性。

英国通过各种互联线路与欧洲连接，能源通过互联线路与该大陆交易。在投票之前，各种报告讨论对进口能源增加关税的可能性，经济咨询公司 Oxera 警告这一做法将为家庭账单增加 1.4 亿英镑。

EY 还警告，在欧洲对于可再生能源的监管支持“很复杂”。尽管法国和意大利凭借新目标和支持框架支持太阳能及其他清洁发电，但是德国和英国撤销支持。

英国连续几个季度在 EY 的可再生能源国家吸引力指数中下降，在最新更新中占据第十一位。

但是尽管一般来看可再生能源发电前景不顺，然而 EY 确实指出，获得长期购电协议支持的资产的数量使投资者提振，EY 表示，长期购电协议能够提供稳定、长期收益。

随着批发能源价格暴跌，最近几个季度英国运营的光伏电站获得购电协议的欲望加强，推动资产持有人减少其接触这种波动的兴趣。

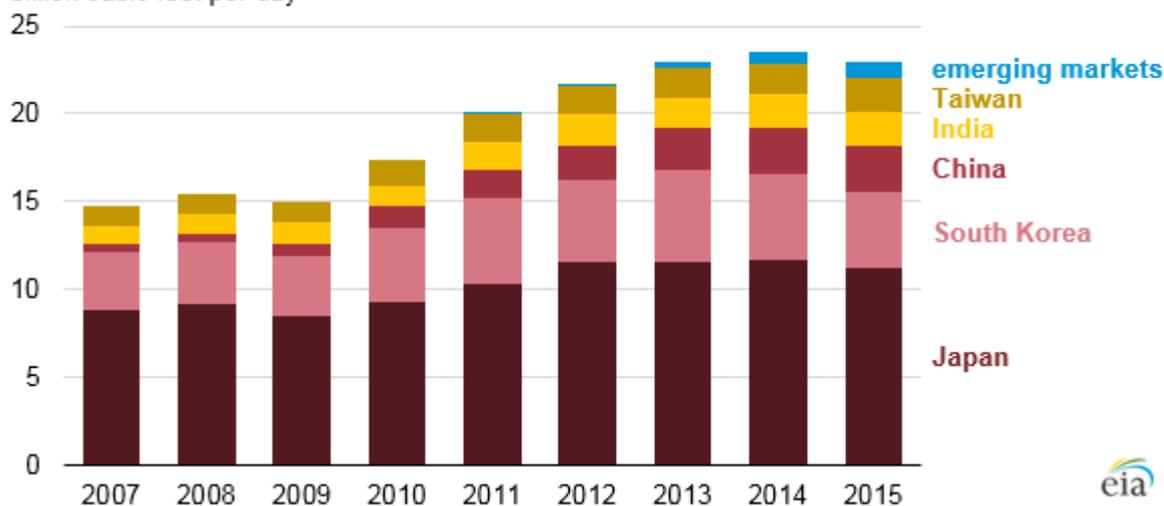
资产所有者，如 Foresight 和 Bluefield，在去年批发能源价格削弱其资产净值后，奉行购电协议。

## Natural Gas (天然气)

### As Japan and South Korea import less LNG, other Asian countries begin to import more

Imports of liquefied natural gas (LNG) in selected Asian countries (2007-15)

billion cubic feet per day



Source: U.S. Energy Information Administration, compiled from several countries' statistical departments

Japan, South Korea, and China are the three largest importers of liquefied natural gas (LNG) in the world, accounting for more than half of global LNG imports in 2015. Combined LNG imports in these countries averaged 18.2 billion cubic feet per day (Bcf/d) in 2015, a 5% (0.9 Bcf/d) decline from 2014 levels and the first annual decline in these countries' combined LNG imports since the global economic downturn in 2009.

Declines in LNG imports in these countries were partially offset by increasing LNG imports elsewhere in Asia. Imports in India and Taiwan, the fourth- and fifth-largest LNG importers, respectively, increased slightly in 2015. However, most of the increase in LNG imports came from emerging Asian LNG markets, such as Malaysia, Singapore, Thailand, and Pakistan. Although LNG demand growth prospects are limited in the more mature markets of Japan and South Korea, LNG demand in China, India, Taiwan, and emerging Asian markets is expected to grow in the future.

In Japan, South Korea, and China, reduced demand for natural gas in the power sector, driven by slower economic growth and lower-priced competing fuels, resulted in reduced LNG consumption in 2015. Cooler-than-usual temperatures as a result of effects from El Niño also contributed to lower electricity consumption and reduced LNG imports in those countries.

Potential for LNG demand growth in both Japan and South Korea may be limited. Japan's total electricity consumption has fallen for five consecutive years, and nuclear generation is gradually returning to service, likely reducing natural gas use for electricity generation. In South Korea, government policies that favor the use of coal and nuclear over natural gas for electricity generation led to a greater use of coal-fired and nuclear power plants.

In China, the lower prices of competing fuels and the slowdown in the growth of the Chinese economy drove the 2015 decline in LNG imports. Natural gas use in China may increase for several reasons: the implementation of environmental policies promoting use of natural gas in the power, industrial, and transportation sectors; the availability of imported global LNG supply at relatively low prices; and growing capacity of LNG regasification.

Emerging Asian LNG import markets, including Thailand, Malaysia, Singapore, and Pakistan, currently account for a small share of total Asian LNG imports, but they may have the potential to increase their LNG imports soon. LNG import growth in these countries is driven primarily by the increased use of natural gas for power generation.

- In Thailand, the combined effects of declining domestic natural gas production near consuming centers and strong growth in natural gas demand are driving LNG import growth. Although LNG imports provide a relatively small share of natural gas supply in Thailand, the country's LNG imports are projected to increase because of limited growth potential for domestic production and for pipeline imports from Myanmar, its two main supply sources.

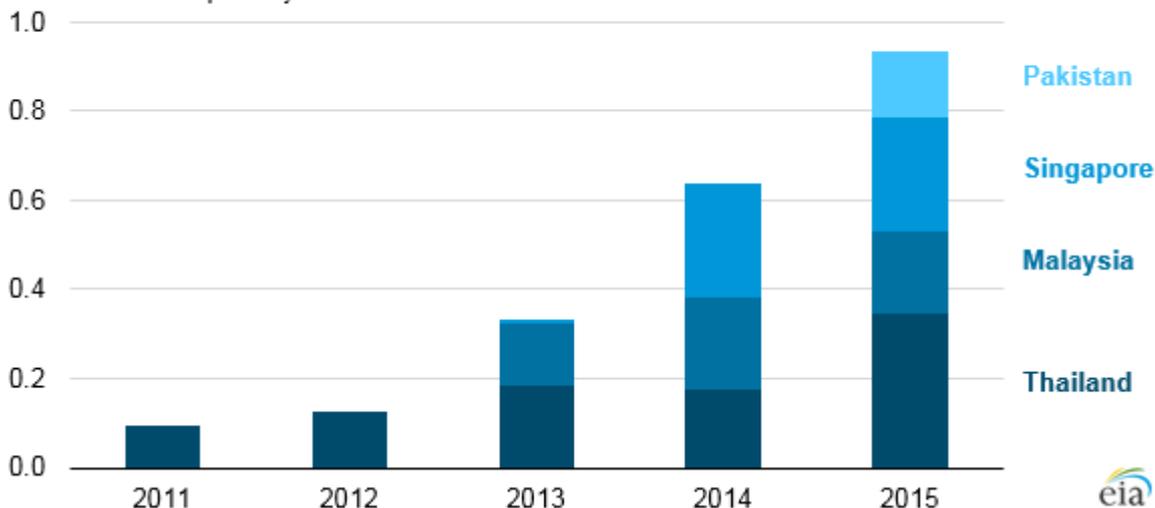
- Malaysia began importing LNG in 2013. The country's LNG imports are projected to grow moderately, limited by competition from lower-priced coal and domestic natural gas prices.

- Prospects for LNG demand growth in Singapore depend on the country becoming an LNG trading hub in the region. Singapore is increasing regasification capacity and launched the SGX LNG index in an effort to establish a regional Asian LNG hub.

- Pakistan began importing LNG in March 2015. Pakistan's LNG imports are projected to double in the next two years. Declining domestic production and rapidly growing natural gas demand in the power generation and industrial sectors, results in increases in LNG imports.

Liquefied natural gas imports in emerging Asian markets (2011-15)

billion cubic feet per day

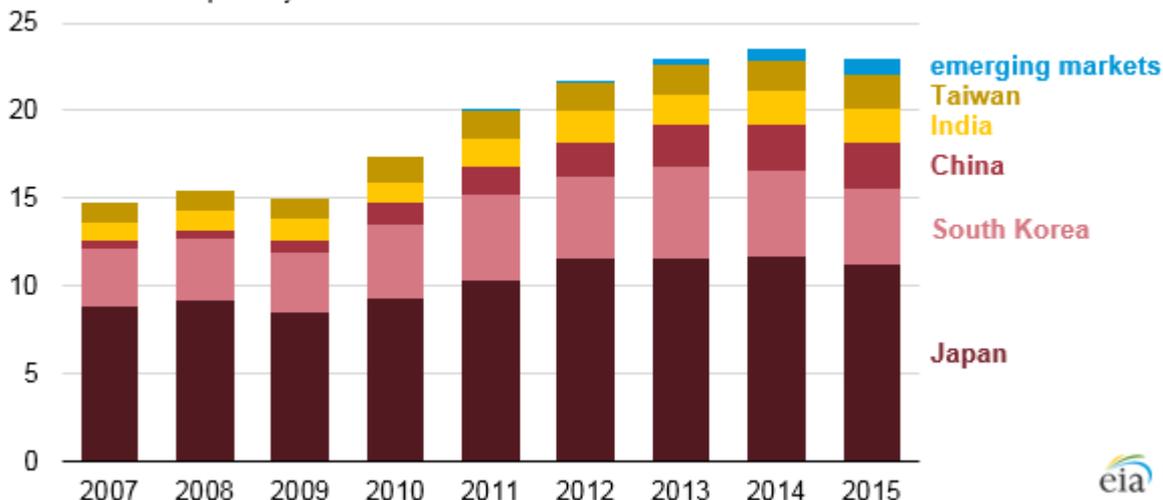


Source: U.S. Energy Information Administration, compiled from several countries' statistical departments

## 日本和韩国进口液化天然气减少，其他亚洲国家液化天然气进口增多

Imports of liquefied natural gas (LNG) in selected Asian countries (2007-15)

billion cubic feet per day



资料来源：美国能源信息管理局，由多个国家统计部门编制

日本、韩国和中国是世界上液化天然气（LNG）的最大的三家进口商，2015 年占据一半以上的全球 LNG 进口量。结合 2015 年这些国家平均为 182 亿立方英尺/天的液化天然气进口量，从 2014 年降低了 5%（9 亿立方英尺/天），这些国家的联合液化天然气进口自 2009 年全球经济衰退以来首次出现了年度下降。

这些国家的液化天然气进口的下降，部分被亚洲的其他地方的增加的液化天然气进口所抵消。印度和台湾的进口量，分别为第四和第五最大的液化天然气进口国，各自在 2015 年略有增加。然而，大部分的液化天然气进口的增加来自新兴的亚洲液化天然气市场，如马来西亚、新加坡、泰国和巴基斯坦。虽然液

化天然气的需求增长前景在日本和韩国这种更成熟的市场有限，但是在中国、印度、台湾和亚洲新兴市场的未来预期会增长。

在日本、韩国和中国，对电力部分的天然气需求减少，是受到经济增长放缓和低价竞争的燃料的影响，导致 2015 年天然气消费减少。低于常温是由于厄尔尼诺的影响，也有助于降低电力消耗，减少在这些国家的液化天然气进口。

在日本和韩国的液化天然气需求增长的潜力可能是有限的。日本的总用电量已连续五年下降，而核发电正在逐步恢复服务，有可能减少天然气发电的使用。在韩国，政府的政策，使得使用煤炭和核高于天然气发电，导致燃煤和核电厂的更大使用。

在中国，低价格竞争的燃料以及中国经济增长放缓，使得 2015 年液化天然气进口下降。中国的天然气使用可能会有几个增加的原因：环境政策的实施推动了天然气在电力、工业和运输行业的使用；以相对较低的价格进口的全球液化天然气的供应以及液化天然气再气化能力的增强。

新兴的亚洲液化天然气进口市场，包括泰国、马来西亚、新加坡和巴基斯坦，目前占亚洲液化天然气进口量的一小部分，但他们可能有潜力很快增加他们的液化天然气进口。这些国家的液化天然气进口增长主要是由天然气发电量的增加所驱动。

- 在泰国，在消费中心附近的国内天然气产量下降和天然气需求强劲增长的综合影响推动了液化天然气进口增长。虽然液化天然气进口在泰国提供了一个相对较小的份额的天然气供应，该国的液化天然气进口预计将增加，这是因为国内生产的和从缅甸管道进口的增长潜力优先，这是两个主要供应来源。

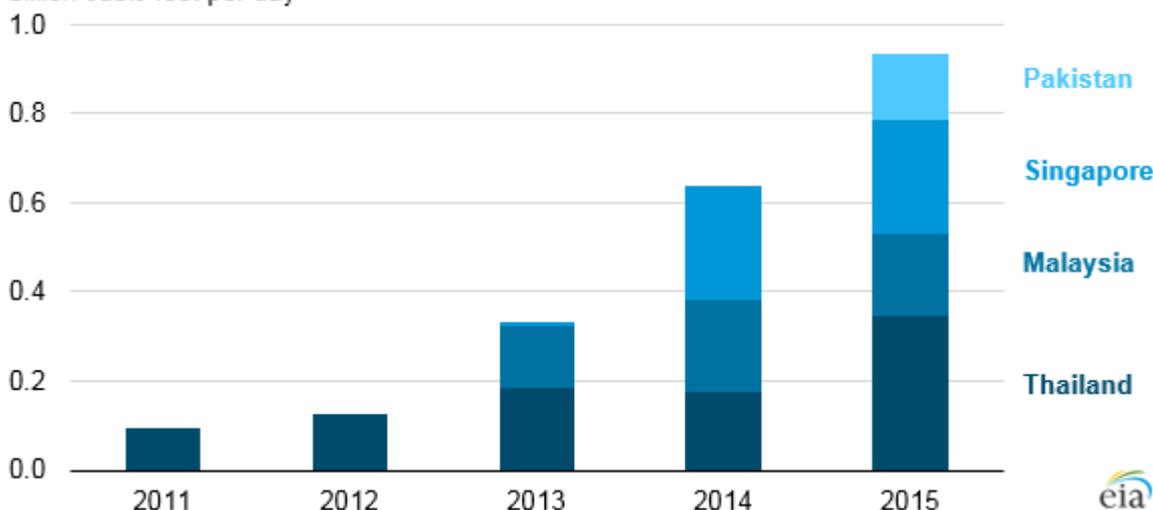
- 马来西亚在 2013 年开始进口液化天然气。该国的液化天然气进口预计将适度增长，受到来自较低价位的煤炭和国内天然气价格的竞争。

- 新加坡液化天然气需求增长的前景取决于该国能否成为该地区的液化天然气贸易中心。新加坡正在提高再气化能力，努力建立亚洲液化天然气枢纽，建立区域性的亚洲液化天然气中心。

- 巴基斯坦在 2015 年 3 月开始进口液化天然气。巴基斯坦的液化天然气进口预计将在未来两年内翻番。发电和工业部门的下降的国内生产和快速增长的天然气需求，导致液化天然气进口的增加。

**Liquefied natural gas imports in emerging Asian markets (2011-15)**

billion cubic feet per day



资料来源：美国能源信息管理局，由多个国家统计部门编制

## BP strikes new shale deal in China

BP has doubled down on its commitment to shale gas in China by striking a second exploration deal with China

## Mcanxixun Information

---

National Petroleum Corporation.

The agreement, covering a 1,000 sq km area of Sichuan province in south-west China, sets BP apart from rivals such as Royal Dutch Shell and ConocoPhillips, which have backed away from investments in Chinese shale gas.

Analysts say the high cost of shale exploration in China has made it vulnerable to deep cuts in capital expenditure by energy companies in a period of protracted low oil prices. However, BP is eager for new resources after a period of retrenchment since the disastrous Deepwater Horizon oil spill in 2010.

BP's contract with CNPC involves a block called Rong Chang Bei, adjoining the companies' existing partnership in Neijiang-Dazu. CNPC will have operational control in both cases. Financial terms were not revealed.

Thursday's deal represented a renewed sign of commitment from BP to China after Sinopec said last month that the UK group planned to sell its 50 per cent stake in their Secco petrochemicals plant near Shanghai.

The agreement stems from a wider strategic partnership announced between BP and CNPC when Xi Jinping, the Chinese president, visited London last year and came ahead of a visit to China this weekend by Theresa May, UK prime minister, for the G20 summit. Investment ties between the countries have been under scrutiny since Mrs May announced a review in July of the proposed Hinkley Point nuclear power station in which state-owned Chinese investors have a one-third stake.

### BP 与中石油达成第二份页岩气合同

这再次表明 BP 对于中国业务的承诺。自 2011 年“深水地平线”灾难以来过了一段紧日子的 BP，非常渴望开发新能源。

BP 特别加大对中国页岩气业务的投入，与中石油(CNPC)达成了第二份页岩气勘探协议。

这份协议所涉区块位于中国西南的四川省，面积为 1000 平方公里。它让 BP 显得与荷兰皇家壳牌(Royal Dutch Shell)和康菲石油(ConocoPhillips)等对手不同。这些对手不愿在中国投资于页岩气。

分析师表示，在中国页岩勘探成本高昂，令为应对长期油价低迷而大幅削减资本开支的能源公司望而却步。然而，自 2011 年的“深水地平线”(Deepwater Horizon)钻井平台漏油灾难以来过来一段紧日子的 BP，如今非常渴望开发新能源。

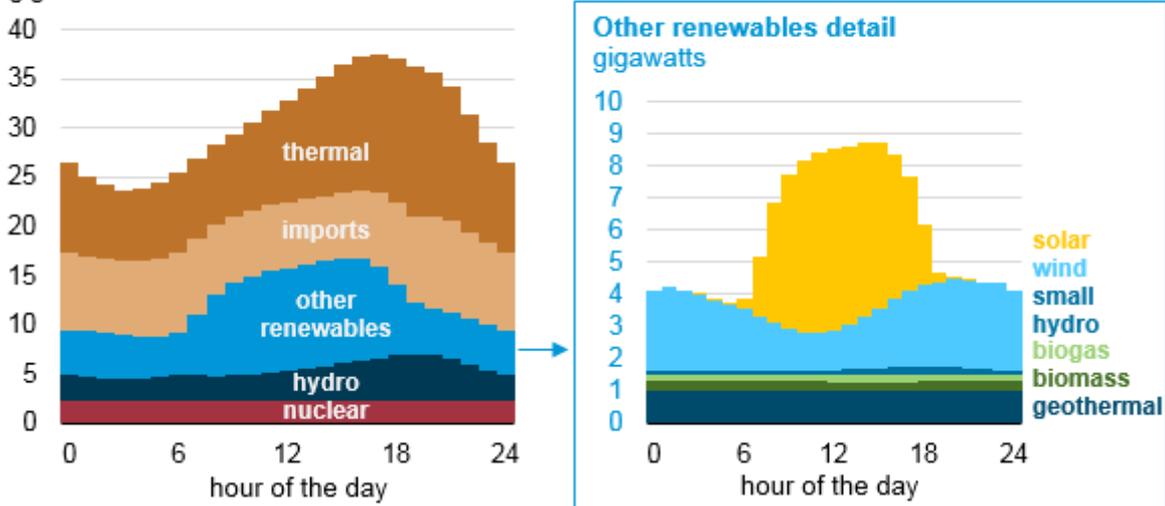
BP 与中石油达成的合同，涵盖一个名为“荣昌北”的区块，毗邻这两家公司在内江-大足区块的既有合作项目。中石油将拥有这两个项目的经营控制权。协议的财务条款并未对外披露。

周四的协议再次表明了 BP 对于中国市场业务的承诺。此前，中石化在上月表示，这家英国集团计划出售其上海附近的赛科石化(Secco)所持 50% 的股权。

这一协议发端于去年中国国家主席习近平访问伦敦时 BP 和中石油宣布达成的战略合作伙伴关系。而不久之后，英国首相特里萨·梅(Theresa May)将到访中国，出席本周末的 G20 会议。自梅在 7 月宣布对所提议的欣克利角(Hinkley Point)核电站项目重新评估以来，中英两国之间的投资关系便一直受到密切审视。中国国有企业在该核电站项目中持有三分之一的股权。

## Natural gas generation and electricity imports used to follow load in California

Hourly average CAISO electricity production (summer 2016)  
gigawatts



Source: U.S. Energy Information Administration, California Independent System Operator (CAISO) as accessed through ABB Velocity Suite

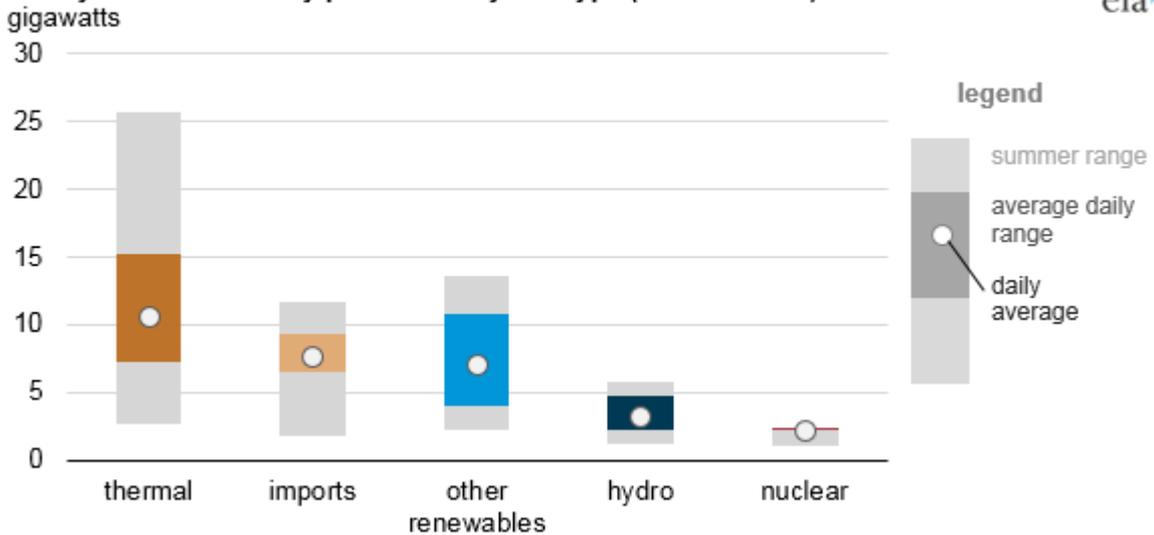
The California Independent System Operator (CAISO), the entity responsible for maintaining the balance between supply and demand for electricity throughout most of the state, operates in a setting where demand peaks in the late afternoon or early evening on summer days. Because of differences in the hourly output of certain electricity generators, some of which are nearly constant (nuclear) and some of which can vary considerably during the day (solar, wind), output from thermal generators (mainly natural gas) and electricity imports from other regions are used to balance overall electricity supply and demand in the region.

Thermal generation in CAISO, almost all of which is natural gas, contributes the largest share of electricity generation in CAISO and has the widest range in hourly generation. Based on hourly data in June, July, and August, on the average summer day in 2016, in-region thermal power output ranged between 7.3 gigawatts and 15.2 gigawatts (GW). Over the entire summer, hourly thermal power output was as high as 25.6 GW at 5:00 p.m. on July 27, when total system demand was high, and was as low as 2.6 GW at 9:00 a.m. on June 12, an hour when demand was relatively low and renewables output was relatively high.

The only nuclear facility in CAISO, Diablo Canyon, consistently provided about 2.2 GW of power after ramping up following a spring maintenance outage. Large hydroelectric facilities combined for about 2.3 GW to 4.8 GW of power on a typical day. Hydroelectric facilities, the most flexible renewable sources, were generally dispatched to coincide with electricity demand, meaning output was often highest during hours of peak electricity demand and lowest during times of low electricity demand.

## Mcanxixun Information

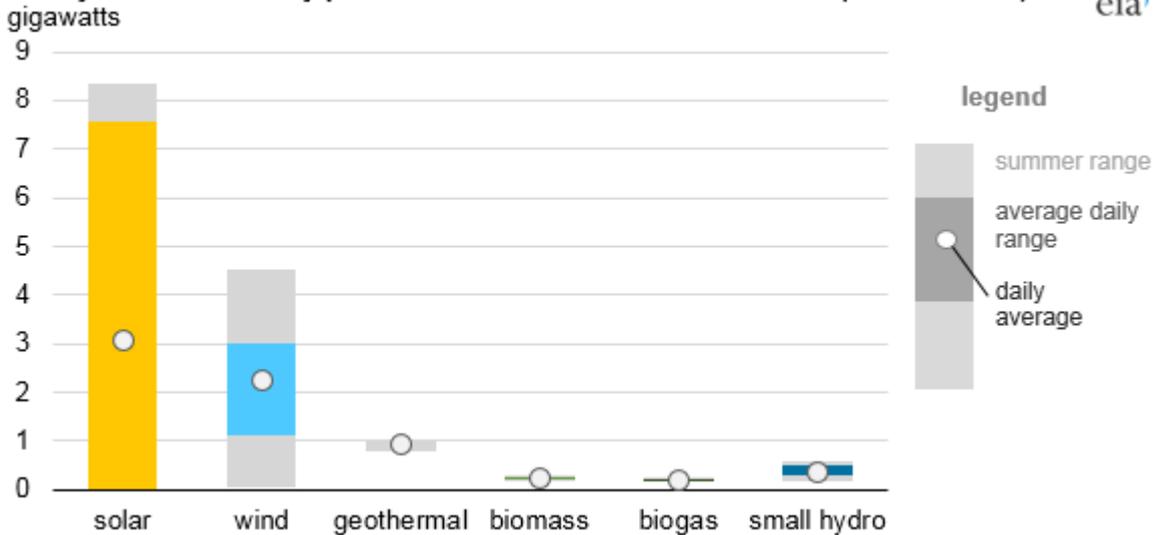
Hourly CAISO electricity production by fuel type (summer 2016)



Source: U.S. Energy Information Administration, California Independent System Operator (CAISO) as accessed through ABB Velocity Suite

Some renewable fuels have more variable levels of output, particularly wind and solar. Most of CAISO's utility-scale solar generation comes from solar photovoltaic systems, whose output is dependent on solar insolation (exposure to the sun) during daylight hours. The CAISO area includes a few solar thermal facilities, some of which have energy storage that allows them to produce electricity after the sun has gone down, but these generators make up a relatively small portion of CAISO's solar output. On an average summer day, utility-scale solar output ranged from 0 GW to 7.6 GW, the largest range among renewable fuels and the only fuel to have many hours without any output. CAISO's data do not include distributed solar generation sources, which reduce the net electric load that needs to be met by utility-scale generators.

Hourly CAISO electricity production for selected renewable fuels (summer 2016)

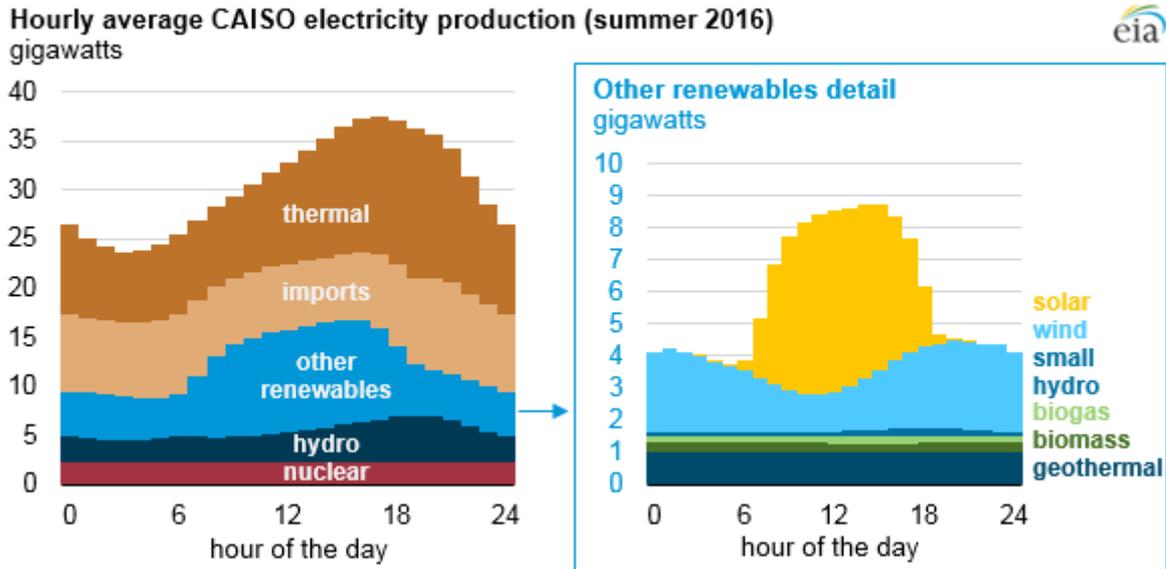


Source: U.S. Energy Information Administration, California Independent System Operator (CAISO) as accessed through ABB Velocity Suite

Wind generators provided about 2.2 GW on average, but they ranged from near zero (0.06 GW) to more than 4 GW several times during the summer. Wind output is often at its lowest point during the middle of the day, when solar output is near its highest. Geothermal, biomass, biogas, and small hydroelectric facilities had lower but more consistent output with relatively small differences between their highest and lowest hourly output.

Electricity imports are another option to supplement electricity produced by in-region sources to balance total supply with system load. Data from EIA's new electric system operating tool show electricity trades among different balancing authorities. CAISO imports electricity from nearby regions such as the Northwest and Southwest. On an average summer day, these imports range between 6.5 GW and 9.4 GW.

## 加利福尼亚的天然气的发电和电力进口量

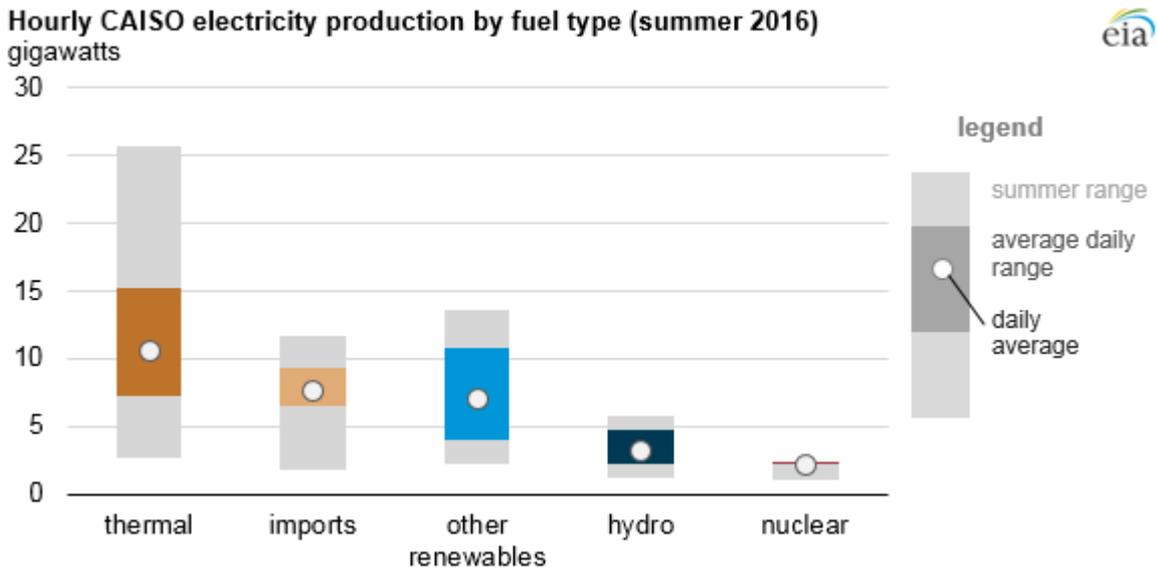


来源：美国能源信息管理局，加利福尼亚独立系统运营商（CAISO）通过 ABB 速度套件访问

加利福尼亚独立系统运营商（CAISO），是负责该州大部分的电力供应和需求之间的平衡的实体，在夏季下午或傍晚高峰时段运行。因为在某些发电机的小时产量的差异，其中一些是几乎恒定的（核），其中一些一天（太阳能，风能）可以相差很大，从热发电机的输出（主要是天然气）和从其他地区进口的电被用来平衡地区该整体电力供应和需求。

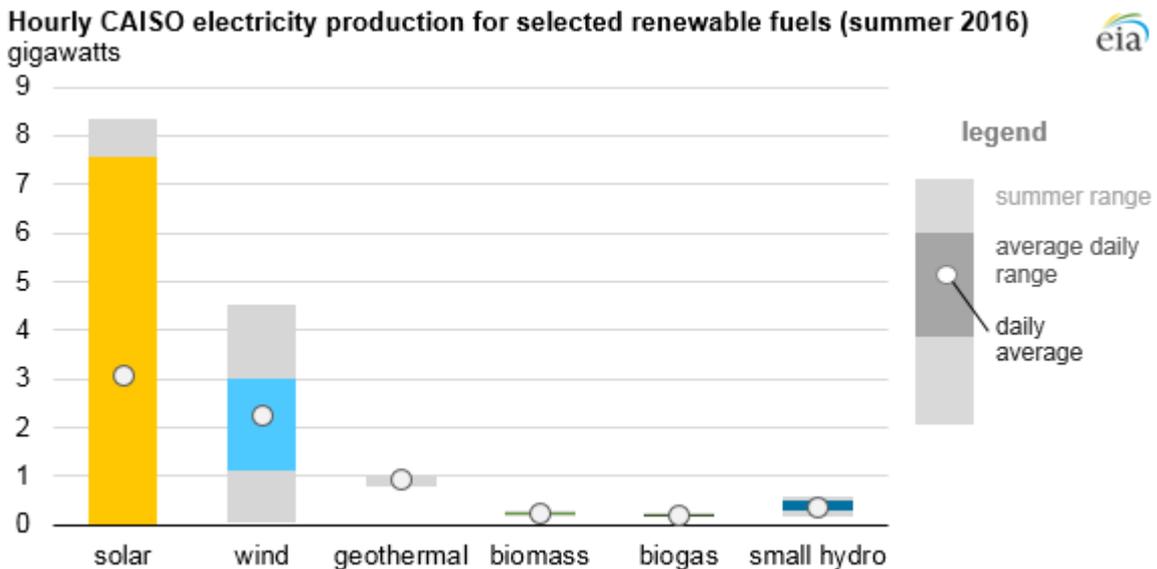
CAISO 的产热，几乎都是天然气，有助于 CAISO 最大的发电份额、小时发电的范围最广。基于在六月、七月和八月的实时数据，2016年的夏天的平均情况，区域的热输出功率范围为7.3 吉瓦和 15.2 吉瓦(GW)之间。在整个夏天，在7月27日下午5点，每小时的热输出功率高达 25.6 吉瓦，此时系统的总需求量很高，6月12日早上9点达 2.6 吉瓦，此时的需求较低，可再生能源的输出是比较高的。

唯一的核设施在 CAISO，暗黑峡谷，在加大接下来的检修停电后，不断地提供约 2.2 GW 的电力。大型水电设施组合，包含了一天约 2.3 GW 到 4.8GW 的电力。水电设施，最灵活的可再生能源，通常被派遣到与电力需求相吻合，意味着输出在电力需求高峰期最高，在低电力需求的时间最低。



来源：美国能源信息管理局，通过 ABB 速度套件访问的加利福尼亚独立系统运营商（CAISO）

一些可再生燃料的产量有更大的变化水平，特别是风能和太阳能。大多数的 CAISO 的公用规模的太阳能发电来自于太阳能光伏发电系统，其输出是依赖于白天的太阳辐射（暴露于太阳下）。CAISO 地区包括一些太阳能设施，其中一些具有能量存储，允许他们在太阳下山后产生电能，但是这些发电机只占据 CAISO 的太阳能输出的一小部分。在一个普通的夏日，公用规模的太阳能输出范围从 0GW 到 7.6GW，可再生燃料的最大范围，也是有很多个小时没有任何输出的唯一燃料。CAISO 的数据不包括分布式太阳能发电，减少了需要由公用事业规模的发电机满足的网电力负荷。



来源：美国能源信息管理局，通过 ABB 速度套件访问的加利福尼亚独立系统运营商（CAISO）

风力发电机平均提供了约 2.2 GW 的电力，但在夏天，它们的范围多次从接近零（0.06 GW）到超过 4GW。风的输出往往在白天是最低点，此时太阳的输出接近它最高的时候。地热、生物量、沼气和小型水电设施更低一些，但输出与他们之间的最高和最低的每小时输出的相对较小的差异更一致。

电力进口是另一种选择，补充电力生产的地区来源，以平衡总供应与系统负载。来自环境影响评估的新的电力系统运行工具的数据显示在不同的平衡当局之间的电力交易。CAISO 从附近的地区如西北、西南进口电力。在一个普通的夏天，这些进口范围在 6.5 GW 和 9.4 GW 之间。

## *Minerals* (矿产)

### **Mystery Myanmar mines shake up world tin market**

Mysterious mines in Myanmar have become important to the world tin market in a sign of how the country's opening-up is revealing resources obscured during decades of military dictatorship and internal conflict.

The Southeast Asian state has caused a stir in metal-rich countries from Peru to Indonesia thanks to its opencast mines in the Wa region near the Chinese border that has been ruled by an armed ethnic party for more than 25 years.

The region is controlled by the United Wa State party, which has an armed wing and has long had close political and economic ties with China.

Myanmar's re-emergence as a big producer of the metal after a break of more than six decades has been branded by one tin market analysis as a "black swan" event.

Over the past four years, Myanmar's return has depressed the tin markets, but this year prices have risen as traders anticipate the supply could peak.

Myanmar's production of initially "astonishingly high" grade ore has surged more than 10-fold in four years in Wa, according to the International Tin Research Institute. The country now satisfies about a third of China's demand for the metal and 10 per cent of global supply. In the first half of the year exports of tin to China surged by more than 80 per cent. The metal is an ingredient of the solder widely used by the electronics industry.

Tin is unlikely to be the last resource surprise as this mineral-rich country presses on with reforms that began when the military dictatorship stepped down in 2011 after almost half a century of isolationist rule. The future of billions of dollars of commodity wealth, some of it in conflict zones, will also be a critical part of peace talks due to be launched this week by Aung San Suu Kyi's fledgling civilian-led government.

Win Htein, an Aung San Suu Kyi confidant, said of the mines at Man Maw in the Wa region: "Even for us, it's still a mystery. They are quiet and very wise — and they keep their movements low-key."

The tin story is just one example of how Myanmar's international reintegration is uncovering resources that one long-time observer of the country says were previously "not known at all — or not known except to a select few".

Uncontrolled exploitation by both Myanmar's regional armed groups and the former ruling military of jade and other assets has driven war, environmental destruction and large-scale tax evasion.

The future of natural boons ranging from tin to timber will loom large at the peace conference starting on August 31 in Naypyidaw, the capital, which is billed as a first step towards ending Myanmar's more than 60 years of on-off internal conflict.

"If the wealth of the country is going to be equitably distributed, it's necessary these resource revenues are captured," said Richard Horsey, a Yangon-based analyst. "They are a large part of the reason why armed groups are sustainable."

There are now signs that tin production could be peaking. That twist could cut revenues for the Wa militia and further boost the rally in the world tin price that has seen it notch an 18-month-high of \$18,770 a tonne.

A peak in Myanmar's production could help push the global tin market into a deficit in a few years, as production has also declined in other producing countries such as Peru and the Democratic Republic of Congo. In Indonesia, a rule banning the export of unprocessed materials has also hurt exports.

Robin Bhar, an analyst at Société Générale, said he expects the market to move into a deficit of 5,000 tonnes next year. That could leave China short of supply, he said.

Myanmar production is likely to level off because the mainly open pit mining in Wa has now moved underground, where the tin content of the ore is lower, the ITRI said. But Cui Lin, an ITRI analyst who has visited the mines, warned that it was unclear how much tin there was, as large parts of the area remained unexplored.

### 缅甸搅动全球锡市场

缅甸神秘的矿藏对全球锡市场变得重要起来，这一迹象表明，这个国家的开放正将数十年军事独裁和国内冲突期间不为外界所知的丰富资源展现在世界面前。

得益于佤邦地区的露天矿藏，这个东南亚国家已在金属资源丰富的国家（从秘鲁到印度尼西亚）中搅动起波澜。佤邦靠近中国边境，已被一个拥有武装的少数民族政党统治了 25 年以上。

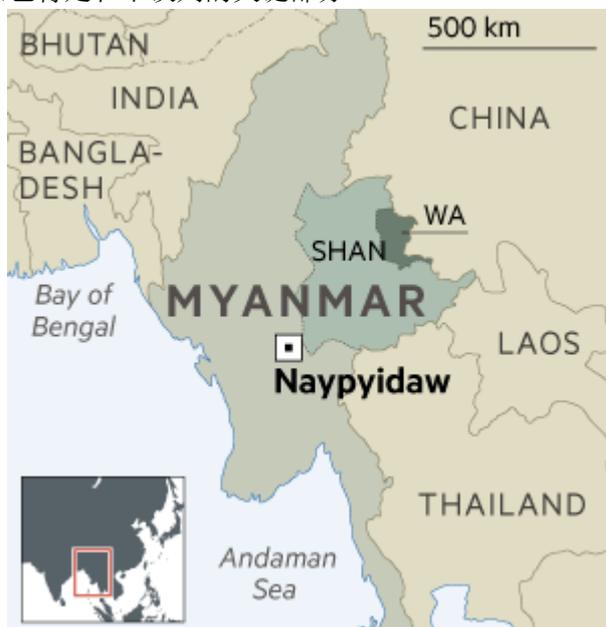
佤邦由佤邦联合党(United Wa State party)控制，该党拥有一支武装力量，长期以来一直与中国保持着密切的政治经济联系。

缅甸时隔 60 多年后重新崛起成为锡生产大国，这被一份锡市场分析报告归为一起“黑天鹅”事件。

过去四年里，缅甸的回归压低了锡市场价格，但随着交易商预期供应可能见顶，今年价格已经上涨。

国际锡研究协会(International Tin Research Institute)数据显示，过去四年，缅甸最初“奇高”品味的锡矿石在佤邦的产量增长到原来的 10 倍以上。缅甸现在约满足了中国三分之一的锡需求，以及全球 10% 的供应。今年上半年缅甸对中国锡出口大幅增长 80% 以上。锡是焊料成分之一，在电子工业中使用广泛。

锡可能不会是缅甸在资源方面带给世界的最后一个意外。这个矿藏丰富的国家正在力推改革，这一改革始于 2011 年缅甸军事独裁政府下台后，该政府对缅甸实施了近半个世纪的孤立主义统治。昂山素季(Aung San Suu Kyi)的新文官政府定于本周启动和平谈判，数十亿美元大宗商品财富——部分位于冲突地区——的未来也将是和平谈判的关键部分。



昂山素季的亲信温登(Win Htein)表示，佤邦曼莫(Man Maw)的矿藏“即使对于我们来说也仍然是个谜。它们安静而睿智，而且它们保持了行事低调。”

缅甸重返国际社会正将此前“完全无人知晓或仅为特定的少数人所知”（如一位长期观察缅甸事态的人士所说）的矿藏资源展现在世人面前。锡的故事只是例子之一。

缅甸各地方武装组织、前执政的军方对玉石及其他资源的无节制开采，带来了战争、环境破坏及大规

模逃漏税。

这些自然馈赠——从锡到木材——的未来，将成为 8 月 31 日起在首都内比都召开的和平大会上的重要议题。此次大会被宣传为终结缅甸 60 多年断断续续内部冲突的第一步。

“如果这个国家的财富要得到公平分配，首先必须要得到这些资源收入，” 驻仰光的分析人士理查德·霍西(Richard Horsey)说，“它们是武装组织得以维持的很大一部分原因。”

现在有迹象表明，缅甸的锡产量可能正在达到峰值。这一转变可能将减少佤邦民兵的收入，并进一步提振全球锡价反弹，每吨 18770 美元的价格已是 18 个月以来的最高点。

缅甸锡产量见顶可能帮助推动全球锡市场在未来几年出现短缺，因为秘鲁、刚果民主共和国等其他生产国的产量也出现了下滑。在印度尼西亚，禁止出口未加工原材料的规定也限制了锡出口。

法国兴业银行(Société Générale)分析师罗宾·巴尔(Robin Bhar)表示，他预计明年全球锡市场的缺口为 5000 吨。他说，这或将导致中国出现供应短缺。

国际锡研究协会表示，缅甸锡产量很可能趋向稳定，因为佤邦以露天开采为主的采矿活动现在已经进入地下开采阶段，而地下矿石的锡含量较低。曾参观过这些矿山的该协会分析师崔琳提醒说，目前还不清楚锡储量有多少，因为该地区大部分仍未得到勘探。

## LME owner to launch China trading platform

The owner of the London Metal Exchange aims to target Chinese commodity traders concerned by speculative excesses on the country's domestic bourses, with plans to establish a physical metals trading platform in mainland China next year.

Charles Li, chief executive of Hong Kong Exchanges and Clearing, which bought the LME in 2012, said its planned exchange in Qianhai would make sure prices remained tied to the underlying economy by underpinning it with an LME-style warehouse system for the physical delivery of metal.

“This is a platform for physical users,” he told the FT Commodities Asia Summit in Singapore. “This is a platform for people who trade commodities. The whole idea is not another financial speculation forum.”

The move comes after a surge in speculative activity in Chinese commodity futures caused prices to jump this year, raising questions about the influence of China's growing number of retail speculators on global commodity markets.

The Shanghai steel rebar futures contract, a niche product for the construction industry, briefly became the third-most traded global commodity futures contract in the world in April before exchanges stepped in to raise transaction fees and discipline some members.

The launch of the platform is likely to bring HKEx into competition with China's domestic futures exchanges such as the Shanghai Futures Exchange and the Dalian Commodity Exchange.

Mr Li said that while HKEx's Chinese spot metals exchange was unlikely to offer commodity futures contracts it would still seek to attract banks and hedge funds to the platform that wanted to trade directly in physical metals.

“We want to do everything short of trading futures, we don't believe we will get a licence for that,” he said.

“Obviously the easier thing to provide liquidity is to offer futures contracts and allow many of the Chinese financial players to participate but that requires a licence and China today is not likely to issue a licence for someone else to issue another futures contract.”

HKEx's plans to establish a “lookalike” warehouse system come after years where the LME struggled to launch LME-branded warehouses in China — the world's largest consumer of metals — because of government restrictions.

But the trading platform in Qianhai has won the backing of Shenzhen local government, which will part own the exchange. Mr Li said he hoped to eventually connect the platform to the LME and allow foreign investors to invest in China's physical metals markets.

“Very quickly we are going to find ways to connect the two warehouse systems,” he said.

Mr Li said the 2014 scandal around metals stored in non-LME warehouses in Qingdao, a northern port, had opened an opportunity for the LME to try to expand in China due to the lack of trust in mainland warehouse operators.

### 港交所明年在内地推金属交易平台

伦敦金属交易所(LME)的东家香港交易所(Hong Kong Exchanges and Clearing)计划明年在中国内地设立一个现货金属交易平台，并以内地大宗商品交易商为目标客户，这些交易商正对内地交易所存在的过度投机现象感到担忧。

于 2012 年收购了 LME 的香港交易所集团的行政总裁李小加(Charles Li)表示，计划在深圳前海推出的交易平台将配套建设一个 LME 式的仓储体系，以支持现货金属交割，从而确保金属价格不会与基础经济脱节。

“这是一个服务于实物买家的平台，”他在于新加坡召开的英国《金融时报》亚洲大宗商品峰会(FT Commodities Asia Summit)上表示，“这个平台面向交易大宗商品的人士。整体想法并不是要打造另一个金融投机平台。”

今年以来中国内地大宗商品期货市场投机活动激增，导致价格飙升，这使人们产生疑问：中国日益增多的散户投机者对全球大宗商品市场影响有多大？

4 月，上海螺纹钢期货合约一度成为全球成交量第三的大宗商品期货合约，螺纹钢是一种应用于建筑行业的特定产品。其后，各交易所采取干预措施，纷纷提高交易手续费，并惩处部分会员。

推出前海现货金属交易平台之举，可能使港交所与上海期货交易所(Shanghai Futures Exchange)、大连商品交易所(Dalian Commodity exchange)等内地期货交易所形成竞争。

李小加表示，尽管港交所前海平台不太可能提供大宗商品期货合约，但该所仍将寻求吸引银行和对冲基金参与这个直接交易现货金属的平台。

他说：“我们什么都想做，但不包括期货交易，我们认为我们拿不到这块业务的牌照。”

“显然，要提供流动性，更容易的方式是提供期货合约，允许大量中国金融参与者参与进来，但这要求有牌照，而目前中国不大可能再颁发一块允许发行期货合约的牌照。”

多年来，由于政府限制，LME 难以在世界最大金属消费国中国推出 LME 注册仓库。如今，港交所计划在中国建立一套类似于 LME 仓库的仓储体系。

前海交易平台得到了深圳地方政府的支持，后者将拥有该平台的部分股权。李小加称，他希望最终将该平台与 LME 连通起来，从而允许境外投资者投资中国现货金属市场。

“我们将很快找到连通两个仓储体系的办法，”他表示。

李小加称，2014 年中国北方港口青岛发生与非 LME 仓库有关的丑闻，为 LME 进军中国市场打开了机会窗口，因为投资者对内地仓库运营商缺乏信任。

## Clean Energy (清洁能源)

## **UK Tories wake up to nuclear folly, as wind and solar found to be cheapest**

The decision by the UK's Tory government to put a hold on approval for the world's biggest single energy investment – the Hinkley C nuclear plant – may have less to do with concerns about the potential role of Chinese state companies and more to do with the realisation that new nuclear is a horrendously expensive boondoggle.

The fact that the cost of wind and solar is falling and the cost of nuclear is moving in the opposite direction is of little surprise to anyone involved in the energy markets, even if the nuclear industry and its supporters wish it were not so. But it is news, apparently, to the Tories.

New data uncovered from a previously unheralded National Audit Office report shows that the UK government is now advised that the cost of wind and solar could be around half that of new nuclear by 2025 – between £50-£75/MWh compared to between £80 and £125/MWh for nuclear.

The Guardian reported that previous forecasts, made in 2010 and 2013, showed that the two renewable technologies were expected to be more expensive than nuclear or around the same cost by the time that Hinkley was built. This is the first time the government has shown it expects renewables to be a cheaper option.

The Hinkley Point nuclear project has already blown out in costs and relies on significant government guarantees and subsidies over and above the £92.50/MWh tariff it promises to pay should it ever get built. That tariff then rises with inflation over the course of the 35-year contract, meaning it could more than double in price by 2050, even as the cost of wind and solar fall even further.

“The [energy] department's forecasts for the levelised cost of electricity of wind and solar in 2025 have decreased since 2010. The cost forecast for gas has not changed, while for nuclear it has increased,” the NAO said, with a degree of understatement. The detailed energy department findings have yet to be released.

The assessment is important because the UK, like Australia, is facing major decisions about its generation fleet over the next decade. Unlike Australia, the UK has decided to end coal-fired generation within a decade, and for the last two months the amount of solar production has beaten that of coal production.

Before the Brexit vote, the UK Tories had appeared entirely smitten by new nuclear, despite the evident folly of the project, which had not just blown out in cost from £16 billion to £24.5 billion, but because of the falling price of wholesale electricity, would require a lifetime subsidy of £29.7 billion compared to original estimates of £6.1 billion.

As Bridget Woodman from the University of Exeter wrote recently, accommodating Hinkley meant that the UK government had to essentially redesign the electricity market over the past few years in an effort to create a situation where investment in a new plant looked attractive.

“Pretty much every major policy design has been geared towards creating a perfect environment for Hinkley Point C. That's why it's such a surprise to see the government has now stepped back – a bit – from the brink,” she wrote.

And what the UK government was proposing to build was in sharp contrast to what is being recommended. The head of National Grid, for instance, had last year called for a complete rethink about the nature of energy systems.

“The idea of baseload power is already outdated,” he told Energy Post.

“I think you should look at this the other way around. From a consumer's point of view, baseload is what I am producing myself. The solar on my rooftop, my heat pump – that's the baseload.

“Those are the electrons that are free at the margin. The point is: this is an industry that was based on meeting demand. An extraordinary amount of capital was tied up for an unusual set of circumstances: to ensure supply at

any moment. This is now turned on its head.”

Those thoughts are now being echoed by other experts. David Elmes, the head of Warwick Business School Global Energy Research Network, wrote in the UK edition of *The Conversation* that the UK had painted itself into a corner, and needed to get over the idea that megaprojects were the solution to everything.

“Instead, it should think of a new mix between smaller and larger, be more joined up in considering consumption as well as supply and think more decentralised than central. That expands the industries, companies, institutions and government departments involved.”

This has important implications for Australia, whose official energy blue-print, apart from ignoring climate change, appears fixated with a fascination for nuclear energy and large centralised power plants.

It's an idea that the coal generators are happy to go along with, even encourage, because it necessitates a push-back against the decentralised energy that is now emerging as an obviously cheaper and cleaner alternative to the current business models, and promises to extend the life of their assets.

Slowly, however, it is dawning on more and more conservative politicians that the smaller, distributed energy is the smartest way forward. Not just because solar, particularly in Australia, offers the cheapest technology, but because in combination with storage and smart technology it can offer an alternative to the centralised, gold-plated networks that account for half of consumer electricity bills.

The recent price surge in gas and the concentration of market power that transferred this cost, and a whole lot more, to wholesale electricity prices, particularly in South Australia, means that distributed energy is becoming an increasingly attractive option, because it also adds to competition.

That puts South Australia at the forefront of how Australia proposes to move forward. It has dabbled with the idea of nuclear power, it has suffered from the forces of a powerful oligopoly. Its consumers are being burnt by retailers.

What it and other states need most is a long-term vision for the future, and to not fall into the trap of power system security, which is usually just a euphemism for the status quo. This Friday's meeting of state and federal energy ministers will give us a taste of whether this is possible or not.

## 英国保守党认识到核能的愚行

英国保守党政府决定暂缓批准世界上最大的单一能源投资--- Hinkley C 核电站---可能与关注中国国有企业的潜在作用无关，与新的核能是极其昂贵小事这个认识有关。

风能和太阳能的成本正在下降，核能的成本相反正在上升这个事实对任何参与能源市场的人来说都不奇怪，即使核工业和它的支持者希望它不是这样的。但是很显然，这对保守党来说是一个新闻。

来源于先前不为人知的国家审计署报道的新数据表明英国政府目前正建议风能和太阳能的成本到 2025 年可能将会是核能成本的一半---比起核能的 80£到 125£每兆瓦时，其成本是 50£-75£每兆瓦时。

《卫报》报道说，在 2010 年到 2013 年间做出的预测表明，这两种可再生技术在 Hinkley 核电站建起来的时候，将可能比核能成本更昂贵或者成本差不多。这是第一次政府表明其希望可再生能源是一个更加便宜的选择。

Hinkley Point 核项目由于成本已经失败了，并依赖于显著的政府担保和除了其承诺支付的它曾经建造时的 92.5£每兆瓦时关税之外的补贴。由于在 35 年合同的过程中的通货膨胀，关税上涨，意味着到 2050 年即使风能和太阳能的成本还会有进一步的下降，核能关税的价格将会是现在的两倍多。

“[能源]部门对 2025 年风能和太阳能燃料发电成本的预测在 2010 年开始已经有所下降了。气体的成本预测并没有改变，然而核能的成本却增加了。” NAO 带着一定程度的保守程度说到。详细的能源部门的调查结果还没有公布出来。

评估是很重要的，因为像澳大利亚一样，英国在未来的时间将面临关于新一代舰队的重大决定。与澳大利亚不一样的是，英国已经决定十年之内结束燃煤发电这一代的舰队，在过去的两个月里，太阳能的生产量已经打败了煤炭生产量。

在英国脱欧投票之前，尽管明显很愚蠢，英国保守党已经完全被新的核电项目所迷住了，这个项目失败不仅是因为成本从 160 亿英镑上升到了 245 亿英镑，而且由于电力批发价格的下降，比起原先预估的 61 亿英镑，将需要 297 亿的使用寿命补贴。

正如艾克赛特大学的 Bridget Woodman 最近写的那样，适应 Hinkley 核电站意味着英国政府不得不基本上要在过去的几年里重新设计电力市场，努力创造一种投资新工厂看似很有吸引力的环境。

“几乎每一个主要的政策设计都是朝向为 Hinkley Point C 核电站创造一个完美的环境。这就是为什么看到政府已经退让一点点是这样的令人惊奇。”她写到。

英国政府所提出要建立的以目前推荐的形成了鲜明的对比。例如，去年国家电网的负责人呼吁对关于能源系统的性质进行全面的重新思考。

“基载电力的想法已经过时了。”他告诉能源报说。

“我认为你应该以另一种方式来看在这个问题。从消费者的角度来看，基本电力负载是我为我自己制造的。我屋顶的太阳能，我的热泵---那就是基本电力负载。”

“这些都是在边缘比较自由的电自。重点是：这是一个以满足需求为基础的产业。一个非凡的资本在一系列不平凡的环境中捆绑起来：为了保证任何时刻的供应。现在它所想的就是这个。”

这些想法现在正在得到其它专家的回音。华威商学院全球能源研究网络负责人 David Elmes 在 The Conversation 英国版中写到，英国已经把自己逼享乐死角，它需要克服大型项目可以解决一切问题的这个想法。

“确实它应该想到更小和更大的一种新型结合，更多的考虑消费和供应以及更分散而不是更集中地思考。这扩大了涉及的行业，公司，机构和政府部门。”

这对澳大利亚有重要意义，该国的官方能源蓝图，除了忽视了气候变化，似乎看好核能和大型集中发电厂的魅力。

这是一个煤炭发电厂很乐意赞同的想法，甚至还鼓励，因为它需要一个反击的分散能量，这种能量目前是新兴的明显更便宜更清洁的替代当前商业模式的能量，并承诺会延长它们资产的寿命。

然而，慢慢地，它开始越来越多地被保守派政治家知晓，更小的分布式的能源是最好的方式了。不只是因为太阳能，特别是在澳大利亚，提供了最便宜的技术，而是因为通过与存储和智能技术相结合，它可以提供集中的另一种选择，镀金网络占到了消费者电费的一半。

最近天然气价格的飙升，和将这一成本转移向批发电价的市场力的集中，特别是在南澳大利亚，意味着分布式能源正成为一个越来越有吸引力的选择，因为它也增加了竞争力。

这使得澳大利亚走在了澳大利亚如何向前迈进的最前沿。它包含了核电的想法，它遭遇了强大的垄断力量。它的消费者被零售商毁掉了。

它和其他国家最需要的是一个对未来的长远看法，并不会落入电力系统安全的陷阱之中，这通常是对现状的委婉说法。州政府和联邦能源部长这周五的会议将带我们领略一下这时候可能。

## North Korea conducted fifth nuclear test, says South Korea

North Korea has conducted its fifth nuclear test — its second this year and its largest to date, defying the intensifying international pressure on the isolated communist state.

Seoul's defence ministry said an explosion was detected near North Korea's known nuclear test site at 9:30am

## Mcanxixun Information

---

Korea time on Friday. South Korea's military believes the nuclear test had an estimated yield of 10 kilotons, a ministry official said. The nuclear bomb that was dropped on Hiroshima was 15 kilotons.

Park Geun-hye, South Korea's president, said the nuclear test showed the "maniacal recklessness" of North Korean leader Kim Jong Un.

"What the Kim Jong-un regime will get from the nuclear test is stronger international sanctions and deeper isolation. This kind of provocation would just hasten its self-destruction," Ms Park said.

North Korea had warned it would take "physical counteraction" after Seoul announced a decision in July to deploy a US anti-ballistic missile system in South Korea as a shield against the North's increasing military threats.

### 朝鲜实施第五次核试验

不顾日益加大的国际压力，孤立的共产主义国家朝鲜实施了该国第五次核试验。这是今年的第二次核试验，也是该国迄今规模最大的核试验。

韩国国防部表示，韩国时间周五上午 9 点半，在朝鲜已知核试验场地附近侦测到一次爆炸。一名国防部官员表示，韩国军方认为，这次核试验当量估计为 1 万吨。作为参照，当初投放在广岛的核弹当量为 1.5 万吨。

韩国总统朴槿惠(Park Geun-hye)表示，这次核试验显示了朝鲜领导人金正恩(Kim Jong Un)“疯狂的鲁莽”。

朴槿惠表示：“金正恩政权从这次核试验中得到的，将是更强烈的国际制裁和更进一步的孤立。这种挑衅只会加剧其自我毁灭。”

今年 7 月，韩国政府宣布决定在韩国部署一种美国反弹道导弹系统，作为抵御朝鲜日益增强的军事威胁的盾牌。在那之后，朝鲜曾警告称会采取“实际对抗行为”。

## Koreans near investment in new Cumbrian nuclear plant

A South Korean energy group is closing in on a multibillion-dollar investment in a new nuclear power station near Sellafield in the latest sign of Asian interest in Britain's energy industry.

Korea Electric Power Corporation (Kepco) is in talks about joining the NuGen consortium planning a \$10bn plant at Moorside on the Cumbrian coast alongside existing owners Toshiba of Japan and Engie of France.

The deal, if it goes ahead, would add momentum to Moorside at a time when the rival Hinkley Point nuclear power project in Somerset has been thrown into doubt by concerns about its high cost and the role of Chinese investors in the scheme.

Theresa May, prime minister, is expected to decide this month whether to go ahead with Hinkley, led by EDF of France with Chinese backing, after ordering a review of the £18bn project.

NuGen sees the uncertainty as a chance to leapfrog Hinkley in the race to build the first new nuclear reactor in the UK for more than two decades. However, it is still years behind EDF in securing financing and regulatory approval for its project.

For Kepco, an investment in Moorside would be a chance to gain a foothold in the UK as it builds its presence in the global nuclear industry.

The Cumbrian plant — designed to provide power for 6m homes — would be supplied with reactors by

Westinghouse, the US subsidiary of Toshiba. But Kepco sees the UK as a potential future market for its own technology.

South Korea has set a goal to become the world's third-largest exporter of nuclear reactors by 2030 and has already won a \$20bn contract in Abu Dhabi. Tom Samson, chief executive of NuGen, is former chief operating officer of the Abu Dhabi company, Emirates Nuclear Energy Corporation, which struck that deal.

### 韩国电力接近参与英国新核电项目

一家韩国能源集团接近参与塞拉菲尔德(Sellafield)附近一个巨额新核电项目。这是表明亚洲企业对英国能源业感兴趣的最新迹象。

韩国电力公司(Kepco)正在进行谈判，希望加入 NuGen 财团，跟现有业主——日本的东芝(Toshiba)和法国的 Engie——在坎伯兰(Cumbrian)海岸的穆尔赛德(Moorside)一起规划一座耗资 100 亿美元的核电站。

如果该交易向前推进，将在萨默塞特(Somerset)欣克利角(Hinkley Point)核电项目因出于对成本高和中国企业入股的担忧而产生变数之际，为穆尔赛德的核电建设注入动力。

预计在本月，英国首相特里萨·梅(Theresa May)将做出是否放行欣克利角核电项目的决定。此前，她下令对这个耗资 180 亿英镑、法国电力公司(EDF)主导、中国企业参与的项目进行重新评估。

NuGen 把这种不确定性视为在争取在英国建设 20 多年来首座新核电站的竞赛中超越欣克利角的机会。然而，在为项目获得融资和监管批准方面，它仍然落后法国电力多年。

对于韩国电力公司来说，在它在全球核电行业扩大地盘之际，在穆尔赛德投资是在英国获得立足点的机会。

坎伯兰(Cumbrian)核电站——旨在为 600 万户家庭提供电力——的反应堆将由东芝旗下的美国子公司西屋电气(Westinghouse)提供。但是韩国电力公司把英国视为未来推广其技术的潜在市场。

韩国已经设定了目标，计划到 2030 年成为全球第三大核反应堆出口国，并已在阿联酋赢得价值 200 亿美元的合同。NuGen 首席执行官汤姆·萨姆森(Tom Samson)曾是达成那笔交易的阿联酋核能公司(Emirates Nuclear Energy Corporation)的首席运营官。

## Theresa May to consult security experts over UK's Hinkley decision

Theresa May is to consult her senior security advisers on whether to allow China to take a stake in Britain's nuclear power sector.

The prime minister confirmed at the G20 summit in China that she was seeking advice on the security aspects of Beijing's plan to invest £6bn in the Hinkley Point project.

The Hinkley project, led by EDF of France, was intended to act as a precursor to China building its own reactor at Bradwell in Essex, showcasing its technology to the world.

The security probe will fuel tensions ahead of Mrs May's Monday meeting with Chinese president Xi Jinping, who labelled the Hinkley deal the "flagship project" in a "golden era" of Sino-British co-operation.

Mrs May has never publicly confirmed she has security concerns about Chinese involvement; Downing Street says she wants to review "the component parts" of the Hinkley deal before making a decision later this month.

But asked at the G20 if she would consult her national security council before taking a final decision later this month, Mrs May said: "I will be doing exactly as you said in your question."

## Mcanxixun Information

---

She added: “I look at the evidence, take the advice, consider it properly and then come to a decision.” British officials clarified later this would not be a full NSC review of the Hinkley project, but confirmed that security was one issue being looked at.

Mrs May’s plan to consult her security experts reflects the fear expressed by Nick Timothy, her joint chief of staff, that China could install “back doors” in nuclear facilities allowing Beijing to turn off the lights in Britain at a time of tension.

Meanwhile, British officials travelling to China have been told to leave their phones and other electronic devices at home and to beware of bugging of hotel rooms by the summit hosts.

Asked whether she trusted China, Mrs May said guardedly: “Of course we have a relationship with them. We are working with them. We have some significant investments [from China] into the UK.”

Speaking en route to China, the prime minister promised to make a decision on Hinkley by the end of the month. It would be her first big strategic decision since succeeding David Cameron in July.

Mrs May, a former home secretary, has long expressed security concerns about the aggressive wooing of China by Mr Cameron and his chancellor George Osborne.

Although she said she wanted to build “a strategic partnership” with China, Mrs May is anxious to avoid placing excessive emphasis on ties with Beijing. She stressed that she also wanted to build trade ties with other countries; Japan and South Korea are among those in the region concerned by London’s courtship of China.

### 英首相针对中资参与核电项目咨询安全顾问

特里萨·梅此举将给她与习近平会晤蒙上阴影，中国国家主席把欣克利核电项目称为中英合作黄金时代的旗舰项目。

特里萨·梅(Theresa May)将围绕是否允许中国企业投资于英国核电行业征求她的高级安全顾问们的意见。

英国首相在中国举办的 20 国集团(G20)峰会上证实，她正在就北京方面对欣克利角(Hinkley Point)新核电站项目投资 60 亿英镑的计划征求安全方面的建议。

欣克利角新核电站项目的牵头方是法国电力(EDF)。中国政府有意让该项目拉开中国企业在英国埃塞克斯郡(Essex)布拉德韦尔(Bradwell)自主承建核电站的序幕，向全世界展示中国的核电技术。

上述安全调查将在周一梅与中国国家主席习近平会面前夕加剧紧张氛围。习近平把欣克利角新核电站项目称为中英合作“黄金时代”的“旗舰项目”。

梅尚未在公开场合证实她对中国企业投资于该项目的安全担忧；唐宁街(Downing Street)表示，在本月早些时候做出决定之前，她打算重新评估该项目的“组成部分”。

但在 G20 会议上被问及她是否将在本月早些时候做出决定之前征求英国国家安全委员会(National Security Council)的意见时，梅表示：“我将采取你在问题中提到的完全相同的措施。”

她接着说：“我会考察证据，征求建议，好好地考虑这件事，然后做出决定。”英国官员后来澄清称，这并非意味着国家安全委员会将对欣克利角新核电站项目发起全面的重新评估，但证实，安全问题是目前考察的问题之一。

梅打算向她的安全专家们咨询，反映出了她的联席幕僚长尼克·蒂莫西(Nick Timothy)所表达出的担忧，即中国可能在核电站安装“后门”，令北京方面可以在关系紧张时让英国陷入黑暗。

与此同时，前往中国出差的英国官员已被指示把自己的手机和其他电子设备留在国内，并谨防峰会主办方在酒店客房里安装窃听器。

在被问及她是否信任中国时，梅谨慎地表示：“当然，我们和他们之间保持着关系。我们正在跟他们合作。英国有一些（来自中国的）重大投资。”

在前往中国途中发表讲话时，英国首相承诺将于本月底前就是否拍板欣克利角新核电站项目做出决定。这将是她在今年7月接替戴维·卡梅伦(David Cameron)以来做出的第一项重大战略决定。

之前担任内政大臣的梅长期对卡梅伦和他的财政大臣乔治·奥斯本(George Osborne)积极争取中国表达出安全担忧。

尽管她表示想与中国打造“一种战略伙伴关系”，但梅非常希望避免过分强调英中关系。她强调称，她也想与其他国家发展贸易关系；日本和韩国是对英国迎合中国感到担心的其中两个亚洲国家。

## China and the US to ratify the Paris deal ahead of G20

The world's two biggest polluters will increase pressure on other nations to follow suit

China and the US are expected to officially commit to the Paris climate change agreement this weekend during President Obama's trip to the G20 summit, held in the south-eastern Chinese city of Hangzhou.

The move adds the weight of the world's two biggest CO2 (carbon dioxide) emitters to the climate pact, while putting pressure on other nations to accelerate their domestic ratification processes.

The decision to ratify at the annual meeting of the world's biggest economies will silence sceptics of the deal within the US political establishment, as well as safeguarding it against future political risks, most imminently the country's presidential election on November 8.

By jointly delivering on their commitment to the Paris agreement, which aims to limit global warming to 2C above pre-industrial levels, the leaders of China and the US further consolidate a newfound, mutual cooperation being built around climate change policy.

It also helps to cement president Obama's legacy as a climate change hero two months before he steps down from two terms in office.

The exact timing of the announcement is uncertain and negotiations between the two countries are ongoing, reported Politico.

The breakthrough agreement reached in Paris will likely come into force by the end of the year.

Fifty-five countries accounting for more than 55% of global greenhouse gas emissions (GHGs) need to formally ratify the accord before it can become bound by international law.

As of September 1, 180 countries had signed the Paris text and of these, 24 had deposited their instruments of ratification to the UN, accounting for only 1.08% of total global GHGs. (See our blog for more details on the ratification process).

However, US and China together comprise 40% of the world's emissions, moving the deal much closer towards its goal. But for the agreement to enter into force by the Marrakesh COP22 in November, both thresholds will need to be crossed by 7 October.

The announcement comes three weeks after Brazil, the world's sixth biggest carbon emitter, formally announced that its Senate had passed the agreement. Meanwhile, small island developing states have been quick to step forward, such as the Marshall Islands and the Maldives.

Early ratification will allow countries to hedge against some of the pressing political risks the world now faces; most immediately the US presidential elections.

Republican candidate Donald Trump has become a mouthpiece for climate deniers and American gas and oil interests, who question the validity of the agreement's terms and the sincerity of its partner states.

The real estate tycoon, who once tweeted: “the concept of global warming was created by and for the Chinese in

order to make US manufacturing non-competitive”, told Fox News earlier this year that “China does not do anything to help climate change. They burn everything they could burn; they couldn’t care less... In the meantime, they undercut us in price.”

A 66-page document released at the Republican Party convention in July, titled the "Republican Platform", asserts that coal is a "clean" energy source and promises to defend the mining industry from a pervasive "radical anti-coal agenda".

Once the agreement enters into force, Parties can’t withdraw for at least four years.

Countries will also need to show resolve in negotiating an ambitious outcome at a high-level meeting on the Montreal Protocol in Kigali, Rwanda on October 8-14. The gathering will be a test for Parties as they work together to cut hydrofluorocarbons (HFCs), highly potent greenhouse gases that, if unchecked, could wipe out progress made on carbon savings elsewhere.

The goal for all Parties now is to accelerate their ambitions and outline a roadmap to 2020.

## 中美两国将在二十国峰会前批准《巴黎气候协议》

两个全球最大污染国将施压其他国家进行减排。

本周末，美国总统奥巴马将应邀参加在杭州举行的二十国集团领导人峰会。据悉，中美双方有望在此期间就《巴黎协定》正式做出官方承诺。

此举有望增加两个全球最大的二氧化碳排放国在气候公约中的分量，同时向其他国家施压，敦促他们加快完成各自的协定批复进程。

选择在这个一年一度的全球大型经济体会议上做出这样的决定，不仅将平息美国政治团体中的质疑，同时也将避免气候协议受到未来政治风险的影响，其中最紧迫的无疑是 11 月 8 日举行的美国总统大选。

中美双方共同表示，将致力于实现《巴黎气候协定》目标，确保全球升温幅度不超过工业化前水平 2 摄氏度。此外，双方领导人还决定进一步围绕气候变化政策展开新的双边合作。

两个月后，美国总统奥巴马将正式结束其两届总统生涯。这项决议也为奥巴马树立的气候变化英雄人物形象画上了一个圆满的句号。

据《政治家》报道，声明的具体时间计划尚未确定，中美两国谈判仍在继续。

而这份具有突破性意义的《巴黎气候协议》预计将于今年年末正式生效。

《巴黎气候协议》若要正式生效，成为国际法的一部分，就必须经过 55 个国家的正式批准，且这 55 个国家的温室气体排放量必须超过全球排放总量的 55%。

截至 9 月 1 日，共有 180 个国家签署了《巴黎气候协定》，24 个国家已经向联合国提交了批准书，但是这些国家的排放量累计仅占全球温室气体排放总量的 1.08%。

然而，中美两国合计温室气体排放占全球总量的 40% 左右，若两国批准了该协定，则将推动整个协定朝最终目标迈出一大步。《联合国气候变化框架公约》缔约方会议第二十二次大会（COP22）将于 11 月在马拉喀什举办。要想保证协定在此次大会上生效，就必须在 10 月 7 日前达到上述两项门槛。

就在中美声明发布前 3 周，全球第 6 大碳排放国巴西正式宣布该国参议院通过了《巴黎气候协定》。与此同时，马绍尔群岛和马尔代夫等发展中小岛国家也迅速完成了协定的审议工作。

尽早批准协定将有效对冲全球面临的一些紧迫的政治风险，而目前最紧迫的风险就是美国大选。

共和党候选人唐纳德·特朗普（Donald Trump）俨然已经成了气候变化否定者和美国石油天然气利益的代言人，他们对《巴黎气候协定》条款的有效性以及签署国的真诚度都提出了质疑。

这位地产大亨曾经发推特表示：“全球变暖这个概念就是中国人创造出来服务他们自己利益的，这样他们就能让美国的制造业丧失竞争力。”特朗普（Trump）今年早些时候还对福克斯新闻表示：“中国对拯救气候变化根本没有做出一点帮助。他们把所有可以燃烧的东西都烧了；他们根本不在乎……同时，他

们还要在价格上打压我们。”

今年7月举行的美国共和党大会发布了一篇名为《共和党平台》的文件。这份66页的文件认为，煤炭是一种“清洁”能源资源，并且承诺保护采矿行业免受各种“激进反煤炭议程”的影响。

一旦协议正式生效，各参与国至少4年内都不得退出。

10月8日至14日，《蒙特利尔协定书》高层次会议将在卢旺达首都基加利举行。各国需要在这次大会上就取得更有魄力的成果展现出自己的决心。这次会议也是对与会各国能否协力削减强力温室气体——氢氟碳化物的一次测试。如果无法遏制氢氟碳化物排放，则全球所取得的减碳成果或将被彻底抹杀。

目前与会各方的目标就是提高行动魄力，明确2020年前的行动路线图。

## **Fossil fuel subsidies are the biggest obstacle to low-carbon transition**

G20 countries are falling short on their pledged action to green the economy, say Alvaro Umaña and Peter Eigen

The G20, which meets in China for the first time this weekend, represents the majority of the world's population, economy and greenhouse gas emissions. In the past, it has shown it can act fast and decisively on global matters, most prominently on financial stability. In the modern era, we believe the G20 is the right forum to lead the crucially important mainstreaming of climate policy in the global economy.

The direction of the G20's leadership is captured by the title of international environmental consortium Climate Transparency's new report, *Brown to Green: Assessing the G20 transition to a low-carbon economy*. The world has to turn its back on unsustainable fossil fuels and is already moving towards clean energy. It is not enough just to invest in clean energy, we must leave fossil fuels behind and move together towards low-carbon, sustainable development.

Fossil fuel subsidies are the single biggest obstacle to this mission, and the G20 are the main culprits. Indeed, the subsidies paid to the fossil fuel industry by the developed countries still far outweighs the money they have promised to finance the world's poorest countries to adapt to – and act on – climate change. This has to change.

For years the G20 has talked about reducing subsidies. Now is the time to go beyond announcements and into action, to dump these brown subsidies and move instead towards green investment.

Our report, in its assessment of global emissions, shows how far away we still are from reaching that goal. Global emissions are far too high to keep global warming “well below” 2 degrees Celsius (above pre-industrial levels), as the Paris Agreement mandates. On average, per capita emissions in the G20 countries are 5.7 tonnes of carbon dioxide equivalent per year, when they need to be closer to 1-3 tonnes by 2050.

We need to better monitor emissions in order to estimate their effect on global warming. But emissions alone are not a good indicator when it comes to judging whether we are turning the tide and moving towards a low carbon economy.

Other indicators we have looked at, such as the energy intensity of economies, the carbon intensity of power supply, and the energy demand per GDP, give rise to careful optimism. We are using energy more efficiently and we are doing so by emitting relatively less carbon. But this is not enough, as population and economic growth outweigh the efficiency gains.

These improvements are to some extent due to the strong growth in renewable energy, a worldwide success story, which few would have considered possible 30 years ago. This success is owed to technological progress but equally to groundbreaking policy innovations in particular in Germany and China. The *Energiewende*, as new energy system that is phasing out coal-fired power generation and Germany's fleet of nuclear reactors; and China looks set to beat its pledge to peak its carbon emissions by 2030.

We find there is a need to double renewable energy investment to improve the situation of the poorest, who have no access to energy, and to boost economic growth.

Some countries are doing very well in creating a good investment environment for renewable energy, with China and India as standouts. At the same time, they are the world's largest users of coal. The fact that investors consider these two countries worth investing in – and indeed are making those investments – gives us all hope. Following are Germany, France, the UK and the US. Every country must strive for more and deeper change if progress is to be made.

### 棕色补贴是可持续发展的“最大阻碍”

G20 国集团在低碳转型上做得还远远不够，阿尔瓦罗·乌马纳和皮特·艾根说道。

20 国集团首脑峰会将于本周末在中国召开。这 20 个国家代表了全球大多数的人口、经济和温室气体排放情况。20 国集团成立于 1999 年。过去这些年的一贯表现证明，该组织在全球事务上一向行动果决，在维护金融稳定方面尤其如此。我们相信，20 国集团是在当今全球经济环境下开展气候政策主流意见讨论的绝佳平台。

国际环境联盟气候透明度（Climate Transparency）在最近发布的一篇题为《从灰暗到绿色：20 国集团低碳经济转型评估》（“Brown to Green: Assessing the G20 transition to a low-carbon economy”）的报告中，对 20 国集团在这一方面的行动引导方向进行了阐述。世界必须以清洁能源代替不可持续的化石能源。仅仅投资清洁能源还不够，我们必须放弃化石燃料，共同向低碳、可持续的发展模式转变。

化石燃料补贴是阻碍这一转型的唯一最大阻碍，而 20 国集团正是这个问题背后的主要推手。事实上，发达国家支付给化石燃料产业的补贴远远高于他们承诺向最贫穷国家提供的气候变化适应与行动资金。这个状况必须得到改观。

过去这些年里，20 国集团一直在讨论如何减少补贴，而现在仅仅纸上谈兵已经不够了，我们必须行动起来，放弃这些污染深重的资金补贴模式，努力向绿色投资模式转变。

我们的报告对全球排放问题进行了相关评估，并明确指出了我们与目标之间的巨大差距。正如《巴黎协定》中所述，目前全球温室气体排放量远远不能达到将全球平均气温控制在较工业化前水平升高 2°C 之内的目标。平均来看，20 国集团国家的人均排放量为每年 5.7 吨二氧化碳当量，而我们的目标是要在 2050 年前将这一数字降低到 1-3 吨左右。

我们必须对排放问题进行更好的监控，以估计其给全球变暖带来的影响。但是仅凭排放量一项，并不能很好地说明我们是否已经扭转局势，开始朝着低碳经济方向转变。

不过，经济能源强度、电力供应煤炭强度以及单位国内生产总值（GDP）能源需求等数据显示，一切都在朝着谨慎乐观的方向发展：能源效率得到提高，碳排放相对减少。但这还是不够的，因为目前的效益增益速度并没有追平或超越人口与经济增长水平。

某种程度上来说，目前所取得的进步还要归功于可再生能源近年来的迅猛发展。这可以算是全球范围内的一个产业成功典范。这样的成就，在 30 年前是谁也无法预料到的。这不仅得益于科技进步，还有赖于突破性的政策创新（尤其是在德国和中国）。比如，德国在能源转型（Energiewende）过程中，成功地淘汰了燃煤电厂以及一系列核能发电堆，转而启用了可再生能源供应。而中国也许在 2030 年前碳排放达到峰值，目前看来实现的希望非常大。

我们认为，有必要将可再生能源投资翻倍，帮助能源匮乏的贫困国家走出困境，实现经济增长。

一些国家为可再生能源发展创造了非常理想的投资环境，最典型的当属中国和印度。但同时，这两个国家也是世界上最大的煤炭资源消耗国。事实上，投资者认为中印两国具备投资价值，而且也确实参与了投资，这无疑让我们看到了希望。德、法、英、美等国也紧随其后。若要推进绿色投资，就需要每个国家都以扩大深化变革为己任。

## Big push to "green" China's data centres

Tech companies are turning to energy-efficient data facilities to cut costs and reduce energy use, reports Coco Liu. China's 1.37 billion people, many of them fully connected to the Internet, use an enormous amount of energy as they email, search the Web, or stream video. Indeed, the Chinese government estimates that the country's data centres alone consume more electricity than all of Hungary and Greece combined.

With China's electricity produced mainly from coal, every WeChat message Chinese citizens send helps to speed up global warming. Meanwhile, a large amount of water is being used to cool data centres, further exacerbating shortages in this already water-stressed nation.

But as Chinese technology and Internet businesses look to burnish their environmental credentials and lower costs of operation, many are working to reduce electricity and water usage at their massive computing facilities. The data centres are installing energy-efficient equipment and water-saving cooling towers, as well as making fundamental design changes in data centres to cut energy demand.

In Hangzhou, next to eastern China's Qiandao Lake, the e-commerce giant Alibaba Group has developed a data centre tapping natural water bodies for cooling — the first of its kind in the nation. By using water from the lake to cool servers, Alibaba has been able to stop employing mechanical chillers for most of the year. The water then flows through a 1.5-mile-long canal until the water temperature drops and returns to the lake with minimal impact.

Technicians at the Alibaba facility also monitor heat output of individual servers and provide cooling only if necessary. The company says both efforts have enabled the data centre to use 80% less energy compared with conventional methods.

"Chinese data centre players in recent years have begun to take energy conservation seriously," said He Chunhua, the secretary-general of Beijing-based China Green Data Centre Advancing Federation. Her organisation has already attracted dozens of companies to join the group, He Chunhua said.

In the United States, technology giants Microsoft, Google, and Amazon have emerged as leaders in the field of making giant data centres more efficient and powering them with renewable energy. Microsoft's operations have been 100% powered by renewable energy since 2014, either by purchasing the alternative energy or by generating it, as it does using 2,200 solar panels on its Silicon Valley campus. Google is aiming to power its data centres and other operations entirely with renewable energy, and so far has contracted with alternative energy suppliers to buy more than 2.2 gigawatts of electricity. Amazon is building wind farms to power its data centres and other operations, has set a renewables goal of 100%, and by the end of this year is hoping to power its infrastructure using 40% renewables.

No one knows exactly how many green data centres exist in China, partly because the country doesn't have a clear definition of what a green data centre is. But anecdotal evidence suggests computing facilities with smaller environmental footprints are growing in popularity.

Last year, China's Ministry of Industry and Information Technology launched the country's first green data centre pilot program. Among 84 participants are Chinese banks, factories, telecommunications firms, and even the Prison Administrative Bureau in the northern China city of Harbin.

Yang Peijun, the director of Shenzhen-based Pacific Business Solutions, said that as a data centre operator, his company's chief goal is "to strengthen information technology infrastructure." However, he said that the government also is now insisting on greater environmental accountability. "The two somewhat conflicting responsibilities have left us no choice but to optimise our operation," said Yang. To do so, Pacific Business Solutions has been taking part in the government's pilot program, which enables the company to compare notes with others in the industry and develop higher environmental and efficiency standards.

While the Chinese central government has yet to cap the amount of electricity and water that domestic data

## Mcanxixun Information

---

centres can use, some cities have made it clear that they don't welcome water-intensive, energy-guzzling computing facilities. Beijing, for one, has drawn a red line on the energy efficiency of data centres, and any centre with a power usage effectiveness rating above 1.5 is not allowed to operate there. (Most data centres in China have a rating of 2.2) He Chunhua said that Beijing's restrictions have already forced some companies to leave the city.

Data centre operators are also aware of the value of going green, both for environmental and financial reasons.

"If you look at our cost structure, you can easily understand why we pay so much attention to saving energy," said Li Yong, an engineer at a major Chinese data company. Li asked that his company remain anonymous because he is not authorised to discuss these matters publicly.

According to Li, energy consumption accounts for more than half of operating costs at Chinese data centres. To mitigate the energy demand for cooling, Li said his company has minimised the use of windows in facilities to prevent heat from seeping in, while others have located new data centres in areas with cooler climates.

At its data centre in Beijing, Li and his team take advantage of cold air in winter to blow away heat from servers, in a move to avoid overtaxing the area's water supplies. And in Shanghai, the company has installed advanced cooling systems that cost twice as much as conventional ones, but that reduce water consumption by 25%.

"Although data centres are becoming increasingly water-efficient, the total volume of water they consume remains huge," Li explained. "In water-scarce cities like Beijing and Shanghai, we can't always get the water we need. It's really about securing our supply amid water shortage."

Still, some environmentalists say Chinese companies could do more. "Data centres in China have done a lot to improve energy efficiency, but they haven't done enough in [the] energy transition [to renewables]," said Ada Kong, a Greenpeace researcher who tracks sustainability of the country's data centres.

Unlike Amazon, Google, and Microsoft, Chinese data centre operators are hesitant to make the switch to renewable energy, Kong said. She blamed the addiction to coal, as well as fear that computing facilities couldn't run reliably with fluctuations in solar and wind energy generation.

But there are signs of change. One case in point is Alibaba Group. For now, the only renewable energy deployed at the company's data centres is a rooftop solar project in Hangzhou, which generates enough electricity to light up its office. But the company says it is building a new data centre near Beijing, which will run in part on wind and solar energy.

## 中国大型数据中心：节能节水势在必行

许多中国科技企业正在转向使用节能型数据设备，希望借此降低企业成本，实现公司运营环保化。

中国总人口 13.7 亿，其中很多人都可以完全联网，而他们发送电子邮件、进行网络搜索以及缓冲视频内容都要消耗大量的能源。事实上据中国政府估计，仅其国内所有数据中心的耗电量都要比匈牙利和希腊两国的用电总量要高。

中国的电力主要来自燃煤发电，所以中国人每发一条微信就相当于为全球变暖做出了一份“贡献”。与此同时，数据中心的冷却还要耗费大量的水资源，让中国本就水源紧张的现状雪上加霜。

然而，中国的科技和互联网企业也已经开始准备改变自己的环境形象，同时削减运营成本。比如许多企业就在大型计算机设备所在地开展节电节水。具体来说，包括安装一些高能效设备以及节水冷却塔，同时从根本上对数据中心设计进行改造，从而降低能源消耗需求。

在杭州市千岛湖畔，电商巨头阿里巴巴集团成功开发了一种全新的数据中心模式。该中心在国内首开先河，通过自然水体进行数据设备降温。利用湖水为服务器降温可以使阿里巴巴一年中的大部分时间都无需使用机械制冷设备。在水温冷却之前，湖水需要流经一条总长 1.5 英里的水渠，然后以影响最小的方式重新回归千岛湖。

阿里巴巴的技术人员同样也会监控每个服务器的独立热量输出情况，并只在必要情况下开启冷却程序。该公司表示，得益于上述这两项措施，目前数据中心的能源消耗相比于传统模式已经减少了 80%。

北京中国绿色数据中心推进联盟秘书长何春华指出：“近些年来，能源节约问题已经引起了中国各地数据中心的关注。”她还表示，目前中国绿色数据中心推进联盟已经成功吸引了数十家企业成员。

在美国，微软、谷歌和亚马逊等科技巨头已经成为提高大型数据中心的能效、利用可再生能源的领军力量。自 2014 年以来，通过购买替代能源或者集团自行发电（微软在其硅谷园区使用了 2200 块太阳能电池板），可再生能源已全面覆盖微软集团运营所需能源。谷歌集团也正计划通过可再生能源全面满足其数据中心和其他部门运营所需的电力，并已经与多家替代能源供应商达成了超过 220 万千瓦的电力采购协议。而亚马逊则正着手建立风电农场，希望借此满足数据中心和其他部门运营的电力需求。亚马逊计划今年年底前集团基础设施可替代电力供应比例达到 40%，并在未来实现 100% 完全替代。

没人了解中国现有绿色数据中心的准确数量，部分原因在于，中国一直都没有对绿色数据中心给出一个准确的定义。但是坊间证据显示，环境足迹小的计算机设备正越来越受欢迎。

去年，中国工业与信息化部推出了中国首个绿色数据中心试点项目。共有 84 个单位参与该项目，其中包括银行、工厂、电信公司，甚至还有北方城市哈尔滨的监狱管理局。

深圳太平洋电信股份有限公司总监杨培军（音译）表示，作为一家数据中心运营商，他所在公司的宗旨就是“强化信息科技基础设施”。然而他指出，目前政府也坚持对环境责任提出了更高的要求。他说：“这两个看起来有些冲突的责任让我们别无选择，我们能做的就是优化自己的运营模式。”为了达到这一目标，太平洋电信股份有限公司参与了一个政府试点项目，从而使公司有机会与业内其他企业交换意见，共同开发更加环境友好、高效节能的模式标准。

虽然目前中国中央政府还未对国内数据中心的电力与水资源消耗总量做出上限规定，但是一些城市已经明确表态，不欢迎高耗水、高耗能的计算机设备。比如北京就已经对数据中心的能源效率划出了红线，任何电能使用效率（PUE）高于 1.5 的数据中心都不得进驻北京（目前中国多数数据中心的 PUE 为 2.2）。何春华（He Chunhua）表示，北京的这项严格要求已经迫使一些企业选择了离开。

而数据中心运营商也已经认识到了中心绿色化在环境与财务方面的双重价值。

李勇（音译）是中国一家大型数据中心的工程师，他不愿透露公司的具体名称，因为按照规定他不能公开谈论这些问题。但是他仍然表示：“如果你了解我们的成本结构，你很容易就会明白我们为什么要在节约能源方面下这么大功夫。”

根据李勇的说法，目前中国数据中心的运营成本中，有超过一半都跟能源消耗有关。为了降低冷却所需的能源消耗，李勇所在公司已经尽最大可能减少设施的窗户数量，以防止热量的渗入。也有企业选择将新数据中心建设在气候更寒冷的地区。

李勇及其团队通过冬天的自然冷空气为其北京数据中心的服务器进行降温，以此避免加重该地区本就负担不轻的水资源供应压力。而在上海，该企业则选择安装了一种先进的制冷系统，这套系统的造价是传统系统的两倍，但耗水量却降低了 25%。

李勇解释道：“尽管数据中心的用水效率有所提高，但是整体的耗水量仍然非常惊人。在北京和上海这样水资源匮乏的城市，我们不一定就能尽取所需。所以这一切的努力都是为了在水量稀缺的情况下保证我们的供水安全。”

但是一些环保主义者认为，其实中国企业能做的还有很多。绿色和平的江卓珊主要负责追踪中国数据中心的可持续进程。她表示：“中国的数据中心已经做出了很多节能努力，但是在转换能源结构（向可再生能源转换）方面做得其实还不够。”

此外，她还认为，与亚马逊、谷歌和微软不同，中国的数据中心运营商在可再生能源转型方面显得有些裹足不前。她将原因归咎于对煤炭能源的严重依赖，以及企业对于太阳能与风能电力无法为计算机设备提供稳定运营电力的担忧。

但是变化的迹象逐渐显现。其中最典型的例子就是阿里巴巴集团。目前，该集团唯一的一个可再生能源设

备就是其杭州数据中心大楼顶上的太阳能电池板项目，这些电池板为整个办公楼提供照明电力。不过阿里巴巴方面表示，北京附近新建的数据中心中未来将会使用一部分的风能与太阳能能源。

# Coal (煤炭)

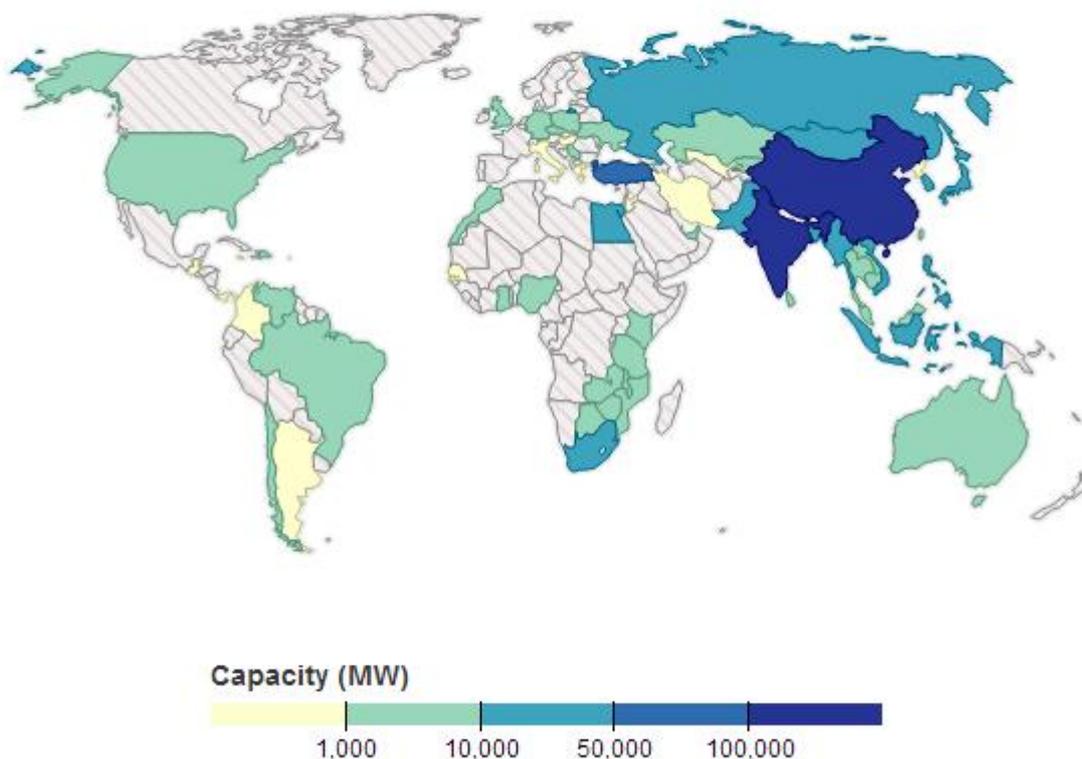
## Global coal plant pipeline slashed in past year

Coal plants under development

A new CoalSwarm assessment finds that the amount of coal power capacity in the developmental pipeline has declined by 14% since the beginning of 2016, due primarily to new restrictions in China and a slowdown in India.

### Coal plants under development

As of July 2016



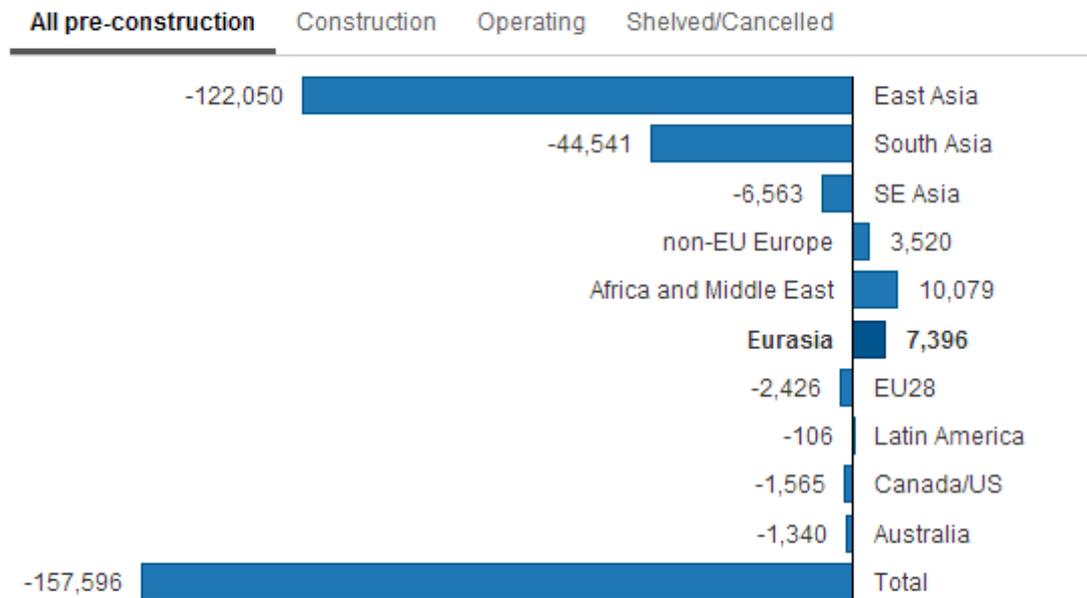
Source: [CoalSwarm, Global Coal Plant Tracker](#) [Get the data](#)

The amount of coal power capacity under development worldwide saw a dramatic drop in the first half of 2016, mainly due to shifting policies in Asia. The results were reported today by CoalSwarm's Global Coal Plant Tracker.

Overall, the "coal plant pipeline"—the total amount of coal-fired generating capacity in pre-construction planning—dropped from 1,090 gigawatts (GW) at the beginning of 2016 to 932 GW in July. The total reduction, 158 GW, or 14% of the previous total, is nearly equal to the entire coal-fired generating capacity of the European

Union (162 GW).

### Change from January 2016 to July 2016 (MW)



Source: [CoalSwarm, Global Coal Plant Tracker](#) [Get the data](#)

The largest drop in the pre-construction pipeline was recorded in China (114 GW), followed by India (40 GW). Both countries recently announced major policy moves away from coal.

In April, China announced sweeping restrictions aimed at proposed coal-fired power plants in 13 provinces. In June, India’s Ministry of Power issued an assessment stating that no further power plants would be needed in the next three years, and “any thermal power plant that has yet to begin construction should back off.”

In Southeast Asia, several countries have taken steps toward reducing or delaying new coal power capacity. In March, Vietnam revised its Power Development Plan VII, canceling or postponing 23 GW of planned coal plants. Indonesia’s RUPTL 2016-2025, covering all power development in the coming decade, showed a rescheduling of over 7 GW of proposed coal power capacity to later years.

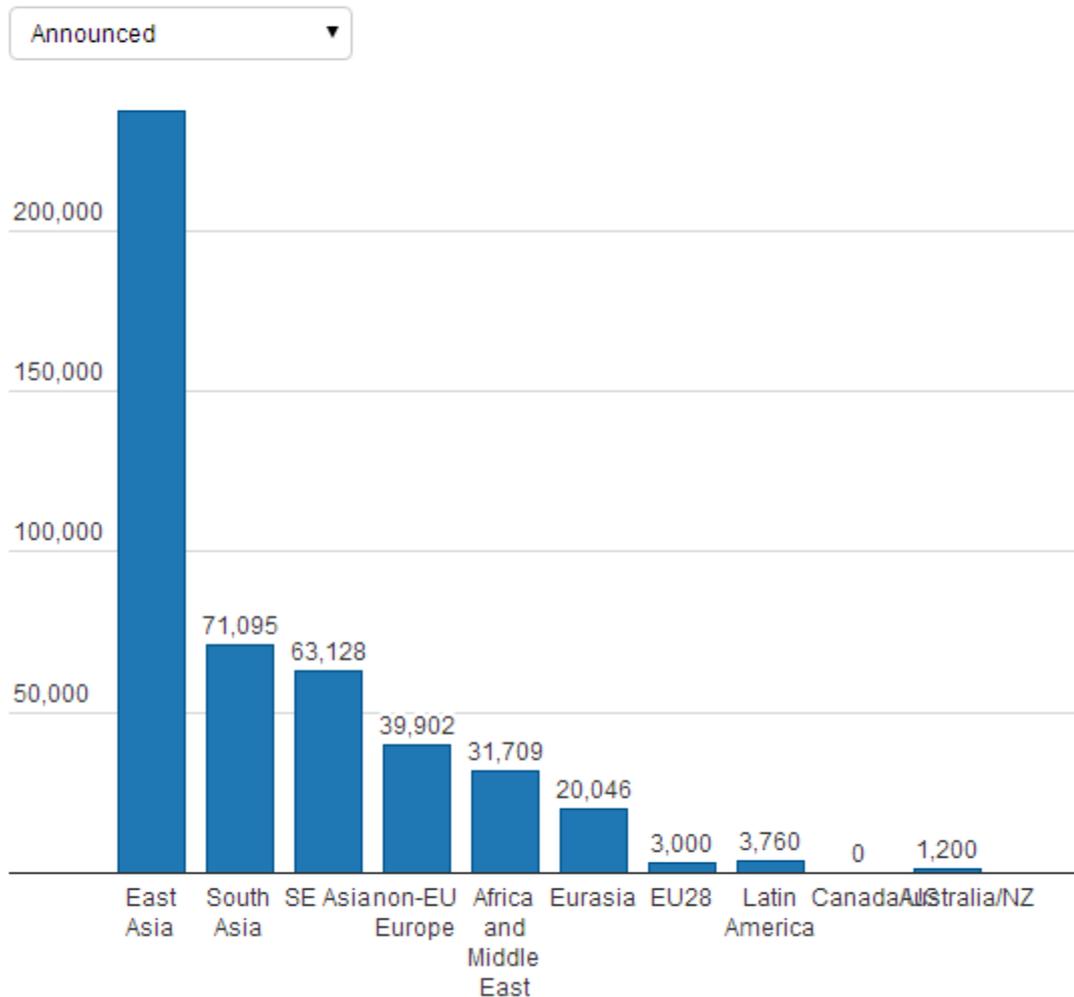
Despite the global reduction in the coal power pipeline, the level of capacity still in planning and construction worldwide is enough to exceed the global carbon budget for limiting warming to 1.5°C. Further, a new report from the IEA shows 6.5 million deaths a year from air pollution, with coal a main factor.

#### Regional Totals

Among world regions, East Asia continues to have the highest amount of capacity under development in all status categories\* except permitted proposals, followed by South Asia:

## Coal plants under development (MW)

All coal proposals by status category, as of July 2016



Source: [CoalSwarm, Global Coal Plant Tracker](#) [Get the data](#)

Altogether there are 932 GW of pre-construction coal proposals (announced, pre-permit, and permitted) and an additional 350 GW under construction.

While slowing in East and South Asia, coal proposals ticked up in Africa and Eurasia. Egypt in particular has been aggressively pursuing new coal plants as an alternative to natural gas. Proposals also increased in Mongolia, mainly for mega coal projects to export power to China.

China and India continue to lead in proposals, but...

China continues to have the most proposed coal plants with 406 GW. However, this is a significant decrease from January 2016, when the country had 519 MW of coal proposals.

Much of the decrease has to do with guidelines issued in April 2016 by the central government that CoalSwarm estimates suspended 77.5 GW of the country's pre-construction proposals. The Chinese government has also suggested it may suspend all new coal plant construction until 2018. The policies are seen as a response to reports of coal overcapacity, locked-out renewables, and declining plant utilization rates in China.

Yet China has an additional 205 GW of coal plants under construction, and commissioned 11,580 megawatts (MW) of new coal in 2016, due to a spike in permitting after the authorization process was devolved to the province level. It remains to be seen how effectively the central government can rein in provincial coal plant building.

### Countries with highest proposed coal capacity (MW)

As of July 2016

Country ▼	Announced	Pre-permit development	Permitted	All pre-construction	Construction
Bangladesh	4,860	8,185	0	13,045	0
China	231,992	147,520	26,340	405,852	205,144
Egypt	17,240	0	0	17,240	0
India	56,130	78,385	43,700	178,215	64,669
Indonesia	24,965	12,735	1,930	39,630	8,215
Japan	3,212	13,521	2,312	19,045	3,059
Mongolia	9,340	1,050	1,200	11,590	900
Myanmar	12,840	710	500	14,050	445
Pakistan	8,305	4,700	5,403	18,408	2,880
Philippines	2,472	6,824	750	10,046	3,780
Russia	9,506	0	0	9,506	1,240
South Korea	2,000	5,340	3,080	10,420	9,254
Turkey	34,262	27,806	8,081	70,149	3,645
Vietnam	13,900	14,200	2,520	30,620	15,789
Zimbabwe	5,030	0	3,900	8,930	0

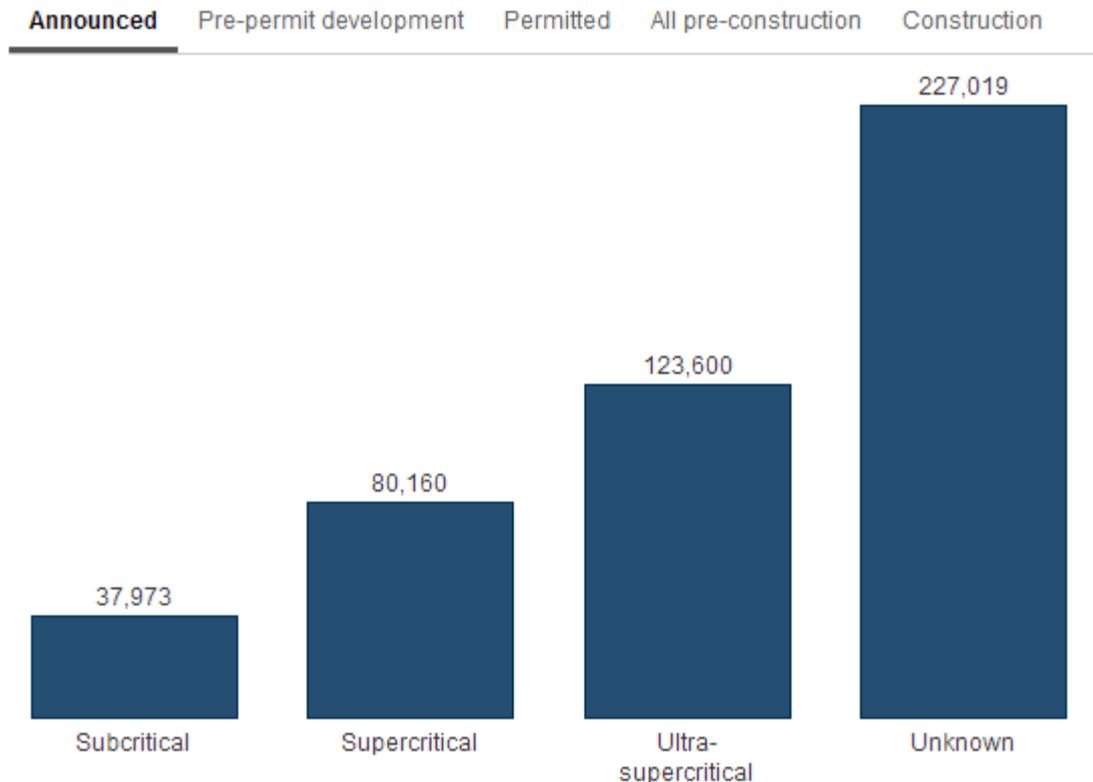
India has the second highest amount of capacity proposed (178 GW) and under construction (65 GW). It was recently reported that 35% of India’s existing coal power capacity is lying idle, raising questions about the viability of future projects.

Most proposals would use supercritical tech

It has been argued that making coal plants more efficient would lower global greenhouse gas emissions. Where combustion technology is known, supercritical combustion accounts for 246 GW, followed closely by ultra-supercritical at 233 GW; few plants would employ subcritical technology (88 GW). Among plants under construction, supercritical and ultra-supercritical combustion also account for most capacity.

## Coal proposals by plant type (MW)

As of July 2016



Source: [CoalSwarm, Global Coal Plant Tracker](#) [Get the data](#)

CO2 emissions would use up entire 1.5°C “carbon budget”

Although most proposed coal plants would employ more efficient ultra- and supercritical plant technology, the level of CO2 emissions that would be produced under current development plans is still incongruent with international climate goals.

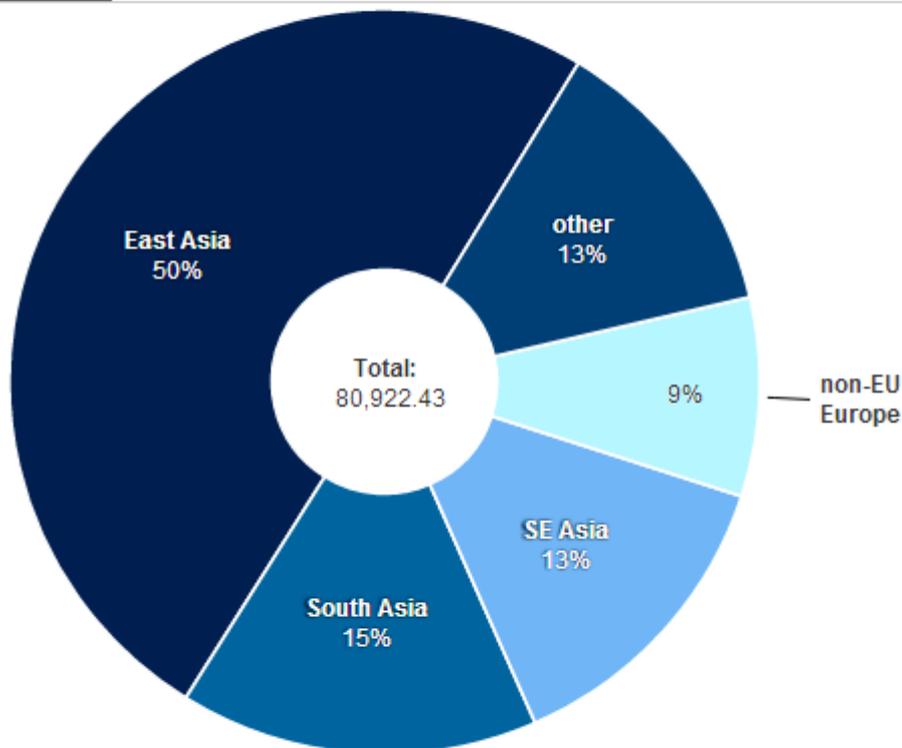
If built, coal plants currently under in construction or in pre-construction development would emit 220,241 million tonnes (Mt) of CO2 over a 40-year lifetime, exceeding the entire 204,620 Mt limit for a high (66%) probability of limiting warming to 1.5°C.

Aggregating all pre-construction and construction categories, just over half the emissions (51%) would come from East Asia.

## Lifetime CO2 emissions from coal proposals (Million tonnes)

As of July 2016

**Announced** Pre-permit development Permitted Construction Total



Assumes 40-year lifetime for coal plants. Parameters for estimating CO2 emissions can be found here: [http://www.sourcewatch.org/index.php/Estimating\\_carbon\\_dioxide\\_emissions\\_from\\_coal\\_plants](http://www.sourcewatch.org/index.php/Estimating_carbon_dioxide_emissions_from_coal_plants)

Source: [CoalSwarm, Global Coal Plant Tracker](#) [Get the data](#)

### Currently operating coal plants

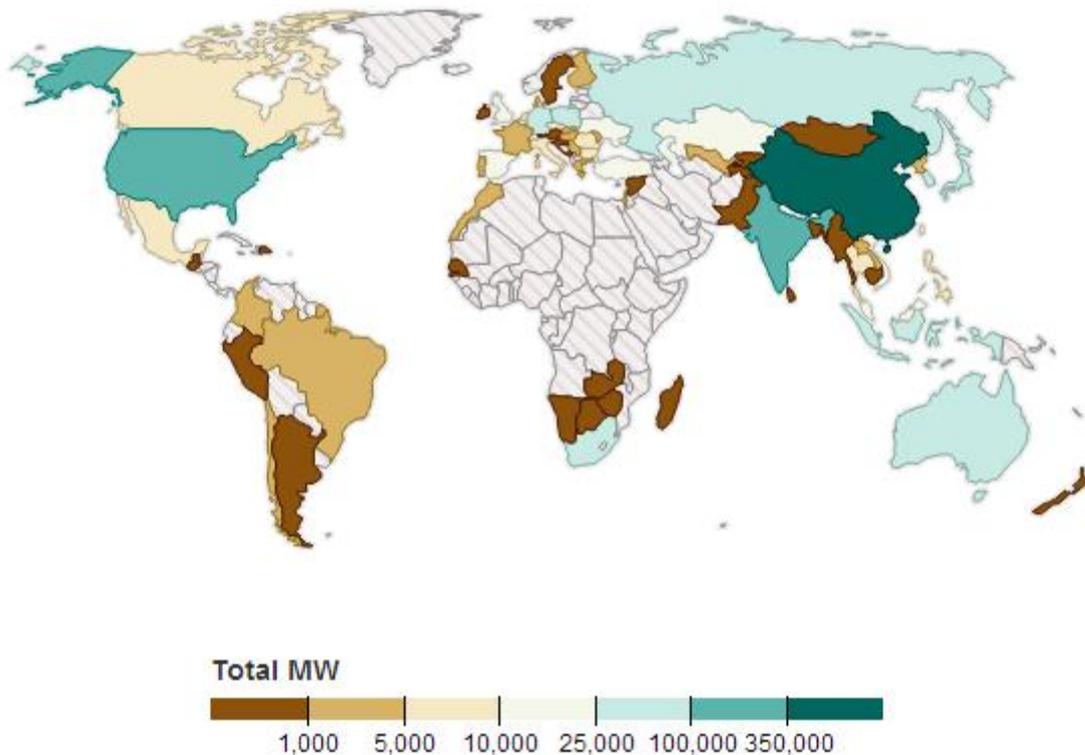
As of the July 2016 update, the Global Coal Plant Tracker now includes all operating coal plants, in addition to proposed coal plants..

At 895 GW, China has by far the most coal power capacity of any country, followed by the US with 302.5 GW and India with 206 GW.

While coal consumption in OECD countries has been falling since 2007, these countries still consume more coal per capita than non-OECD countries.

## Operating coal capacity by country

As of July 2016



Source: [CoalSwarm, Global Coal Plant Tracker](#) [Get the data](#)

\*Note on status categories: Projects that have not entered the permitting process are categorized as “announced.” Those that have begun permitting are categorized as “pre-permit development,” and those with environmental clearance are categorized as “permitted.” Proposals without activity for two years or more, or that have been suspended or called off by sponsors, are categorized as either “shelved” or “cancelled.”

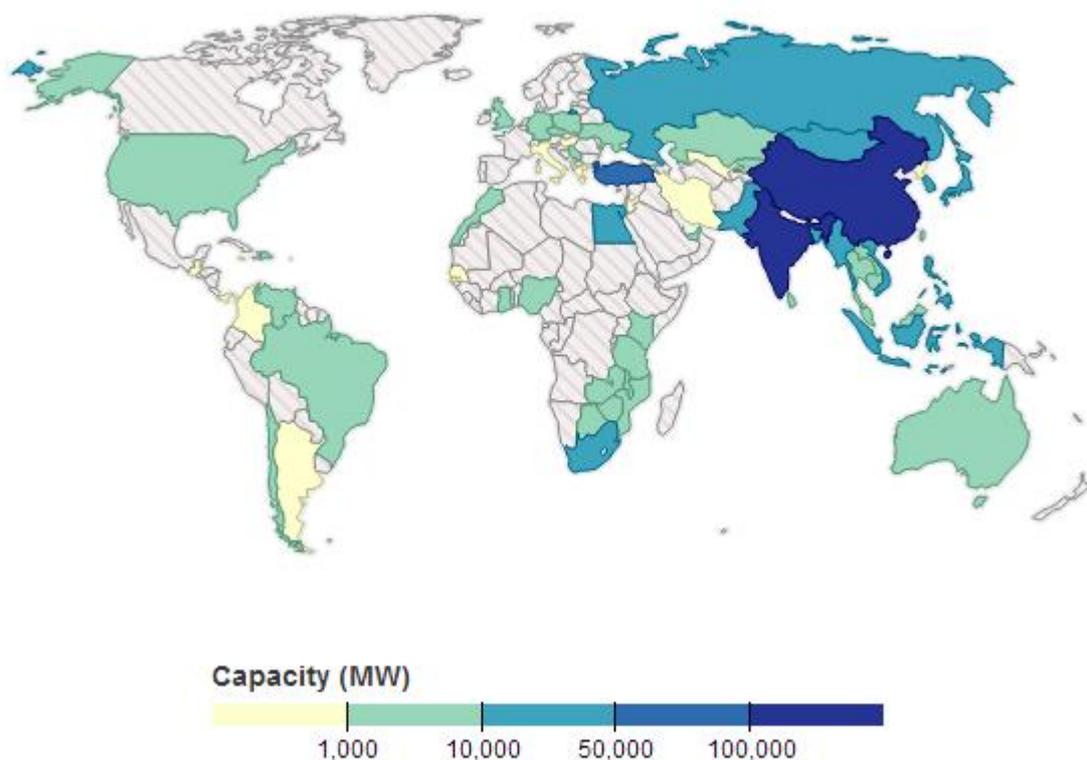
### 去年全球燃煤电厂管道大幅削减

发展中的煤炭发电厂

一份新的蜂窝评估发现，自 2016 年初以来，主要由于中国的新限制和印度经济的放缓，发展管道中的煤发电量已经下降了 14%。

## Coal plants under development

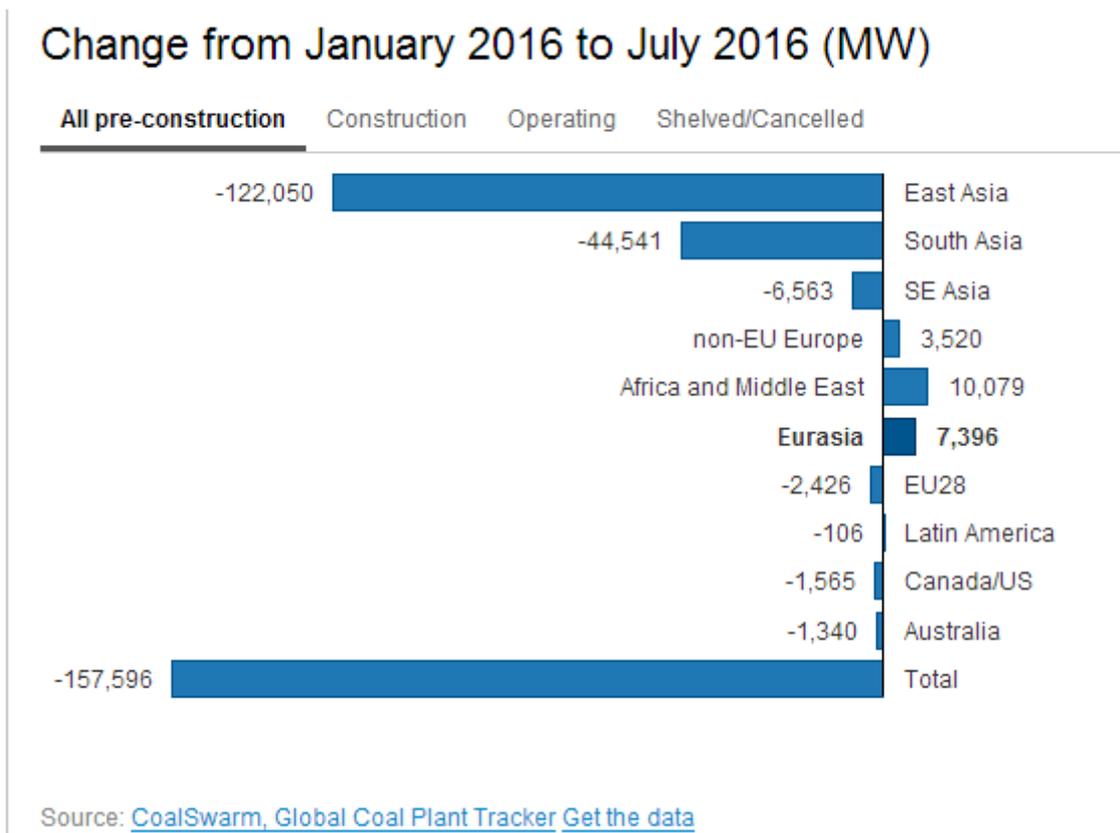
As of July 2016



Source: [CoalSwarm, Global Coal Plant Tracker](#) [Get the data](#)

全球发展下的煤炭电力容量看到见证了 2016 年上半年的急剧下降，主要是由于亚洲的转移政策。今天结果由蜂窝的全球燃煤火电厂追踪报道。

总的来说，“燃煤电厂管道” — 在施工规划前的燃煤发电总量 — 从 2016 年初的 1090 吉瓦 (GW) 下降到了到了七月的 932 吉瓦。总量减少, 158 吉瓦, 或先前总量的 14%, 几乎等于整个欧盟的燃煤发电容量 (162 吉瓦)。



在施工前管道的最大跌幅记录是中国（114 吉瓦），其次是印度（40 吉瓦）。这两个国家最近宣布了重大政策，远离煤炭。

四月，中国宣布了 13 个省份全面限制旨在提出燃煤电厂。今年六月，印度电力部发表了一项评估，声明在未来的三年内，不需要额外的的发电厂，“任何尚未开始建设的火电厂都应该关闭。”

在东南亚，一些国家已经采取措施，减少或拖延新的煤炭发电能力。三月，越南修订了《电力发展规划 VII》，取消或推迟 23GW 的计划燃煤电厂。印度尼西亚的 RUPTL 2016-2025 年，覆盖在未来的十年中所有的电力发展，表明延长超过 7GW 的煤炭发电能力到以后。

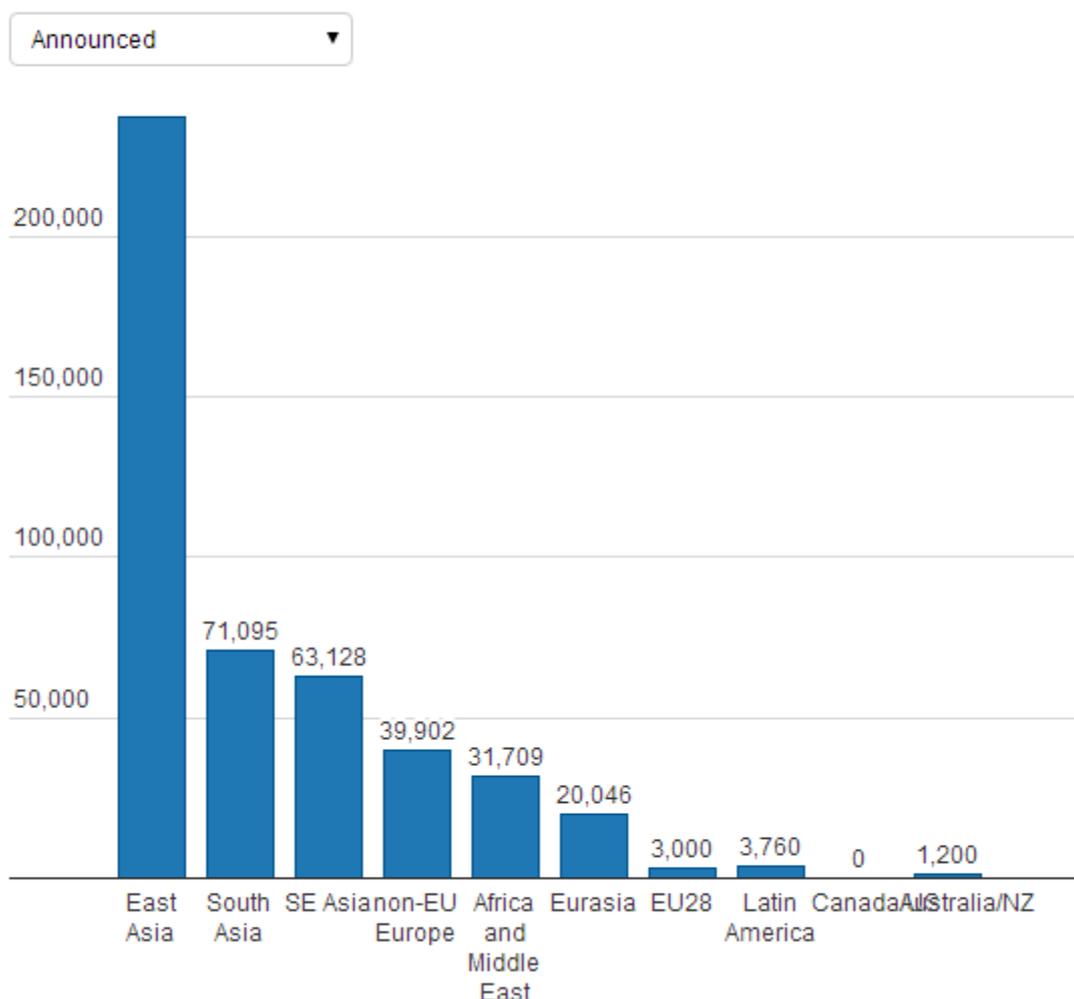
尽管煤电管道全球减量，但是全世界规划和建设的电量水平足以超过限制升温至 1.5° C 的全球碳预算。此外，IEA 的新报告显示，一年 650 万人死于空气污染，而煤是主要因素。

#### 区域总计

在世界上各地区，东亚在发展中的所有状态类别继续有着最高的容量\*除了允许的建议，其次是南亚：

## Coal plants under development (MW)

All coal proposals by status category, as of July 2016



Source: [CoalSwarm, Global Coal Plant Tracker](#) [Get the data](#)

总共有 932GW 的前期建设煤炭计划（宣布，预许可，许可的）和额外的 350GW 在建计划。

尽管在东亚和南亚缓慢，煤炭计划在非洲和欧亚大陆贷款增加。特别是埃及，一直在积极地追求新的燃煤电厂，作为天然气的替代。计划在蒙古也有所增加，主要用于向中国出口的中国大型煤炭项目。

中国和印度继续领导计划，但…

中国将继续有着最推荐的煤电厂，电量 406GW。然而，从 2016 年 1 月开始，有着显著的下降，而国家煤炭计划为 519GW。

大部分的减少都与 2016 年四月由中央政府发行的指导方针有关，CoalSwarm 估计暂停 77.5 GW 的国家施工前计划。中国政府还建议，这可能暂停所有新的燃煤电厂的建设，直到 2018 年。这些政策被视为是在应对煤炭产能过剩报告，暂停可再生能源，降低中国电厂利用率。

然而，中国有一个额外的 205GW 的燃煤发电厂正在建设，在 2016 年投产 11580 兆瓦（MW）的新的煤炭，这是因为在授权过程发展到省一级后允许暂停。中央政府如何可以有效地控制省级煤炭工业建设，还有待观察。

## Countries with highest proposed coal capacity (MW)

As of July 2016

Country ▼	Announced	Pre-permit development	Permitted	All pre-construction	Construction
Bangladesh	4,860	8,185	0	13,045	0
China	231,992	147,520	26,340	405,852	205,144
Egypt	17,240	0	0	17,240	0
India	56,130	78,385	43,700	178,215	64,669
Indonesia	24,965	12,735	1,930	39,630	8,215
Japan	3,212	13,521	2,312	19,045	3,059
Mongolia	9,340	1,050	1,200	11,590	900
Myanmar	12,840	710	500	14,050	445
Pakistan	8,305	4,700	5,403	18,408	2,880
Philippines	2,472	6,824	750	10,046	3,780
Russia	9,506	0	0	9,506	1,240
South Korea	2,000	5,340	3,080	10,420	9,254
Turkey	34,262	27,806	8,081	70,149	3,645
Vietnam	13,900	14,200	2,520	30,620	15,789
Zimbabwe	5,030	0	3,900	8,930	0

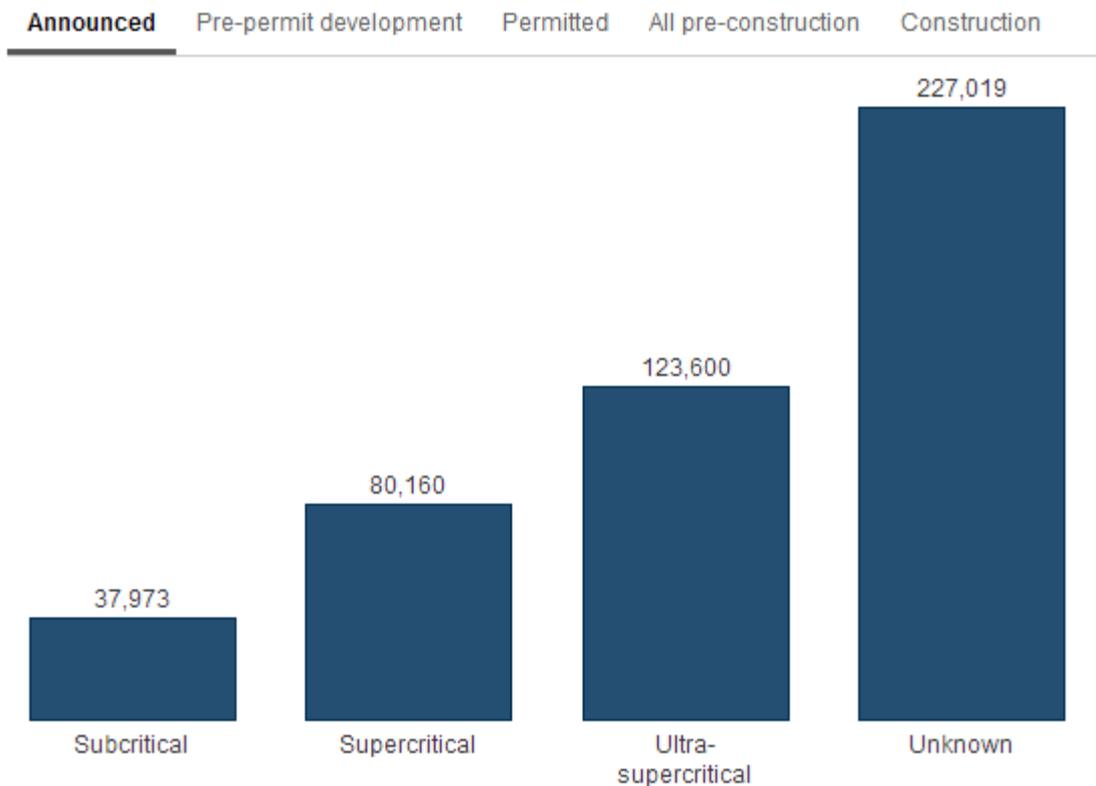
印度有着第二高的容量计划（178 GW）和在建（65 GW）。据最近报道，印度现有的 35% 的现存煤炭发电能力处于闲置，对未来项目的可行性提出了问题。

大多数建议将使用超临界技术

有人认为，使燃煤电厂更有效，将降低全球温室气体排放。燃烧技术是已知的，超临界燃烧占 246GW，紧随其后的是 233GW 的超超临界；极少电厂将采用亚临界技术（88 GW）。在建设中的电厂中，超临界和超超临界燃烧也占据大多数容量。

## Coal proposals by plant type (MW)

As of July 2016



Source: [CoalSwarm, Global Coal Plant Tracker](#) [Get the data](#)

二氧化碳排放量将消耗整个 1.5° C 的“碳预算”

虽然大多数提出的燃煤电厂将采用更高效的超超临界和超临界电厂的技术，但是在目前的发展计划下产生的二氧化碳排放水平还不符合国际气候目标。

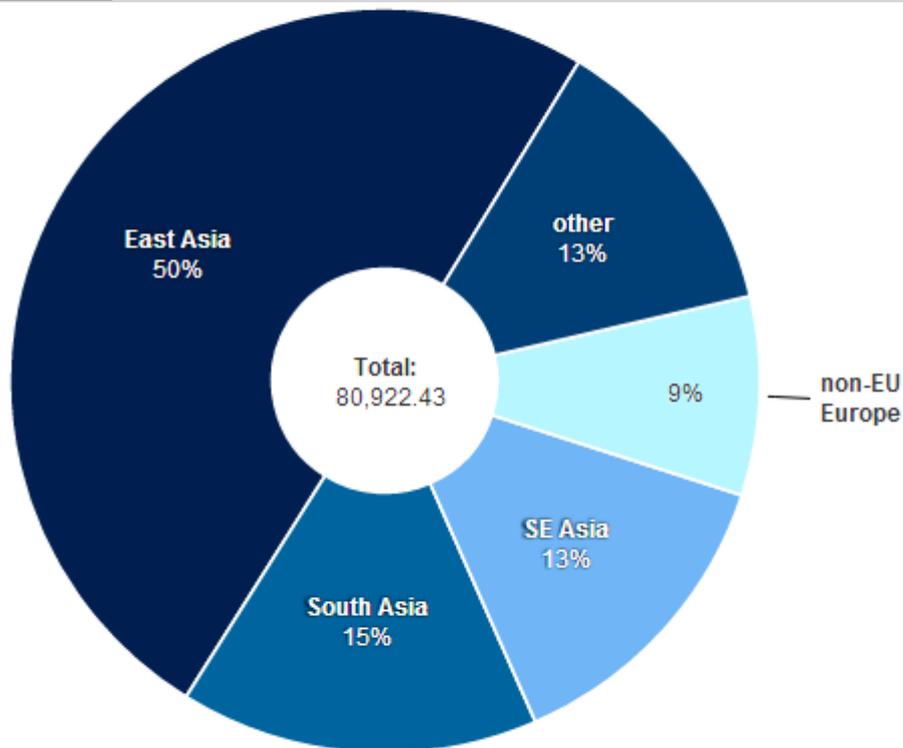
如果建造，目前正在建设中的或在施工前的煤炭发电厂将在 40 年的时间中，排放 2202.41 亿万吨 (Mt) 的二氧化碳，超过了整个限制变暖的概率为 1.5 的高概率 (66%) 的 204620 MT 极限。

聚合所有的预建和建筑类别，只有超过一半的排放量 (51%) 将来自东亚。

## Lifetime CO2 emissions from coal proposals (Million tonnes)

As of July 2016

**Announced** Pre-permit development Permitted Construction Total



Assumes 40-year lifetime for coal plants. Parameters for estimating CO2 emissions can be found here: [http://www.sourcewatch.org/index.php/Estimating\\_carbon\\_dioxide\\_emissions\\_from\\_coal\\_plants](http://www.sourcewatch.org/index.php/Estimating_carbon_dioxide_emissions_from_coal_plants)

Source: [CoalSwarm, Global Coal Plant Tracker](#) [Get the data](#)

目前经营燃煤电厂

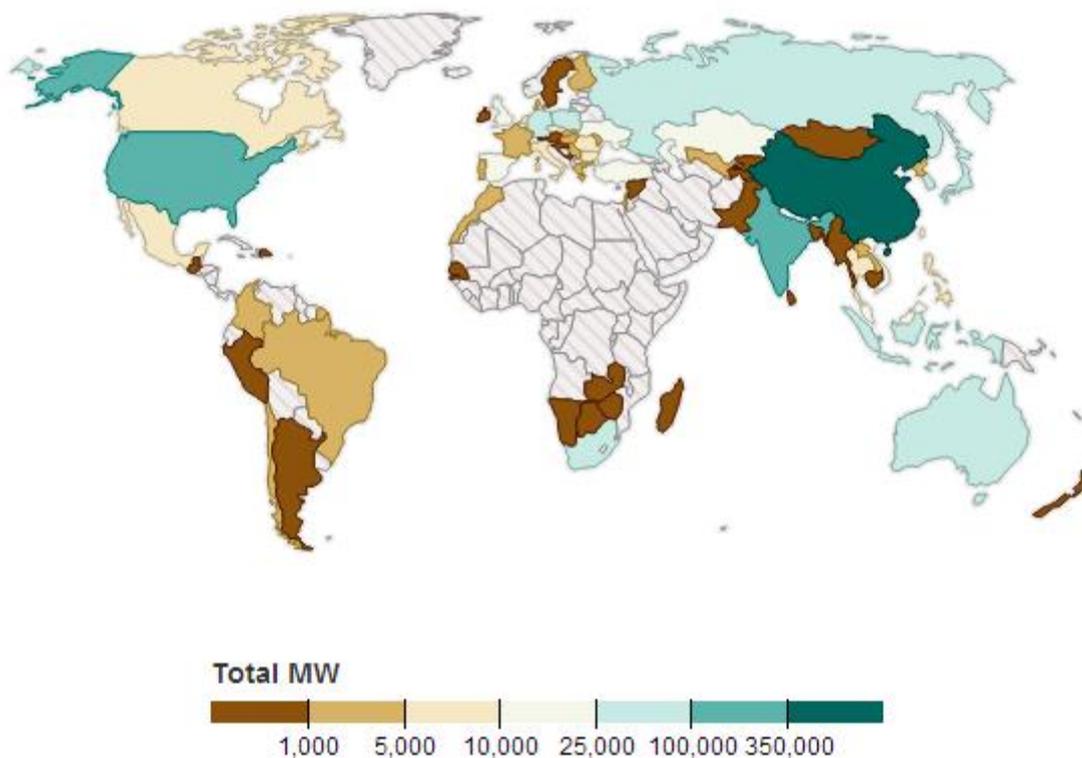
截至 2016 年七月的更新，除了计划的燃煤电厂，《全球煤炭工厂的跟踪》现在包括了所有运营中的燃煤电厂。

中国目前拥有最多的国家煤炭发电能力，为 895GW，其次是美国，为 302.5GW 以及印度，为 206GW。

虽然经合组织国家的煤炭消费量自 2007 年以来一直在下降，但这些国家的人均煤炭消费量仍然比非经合组织国家的国家要多。

## Operating coal capacity by country

As of July 2016

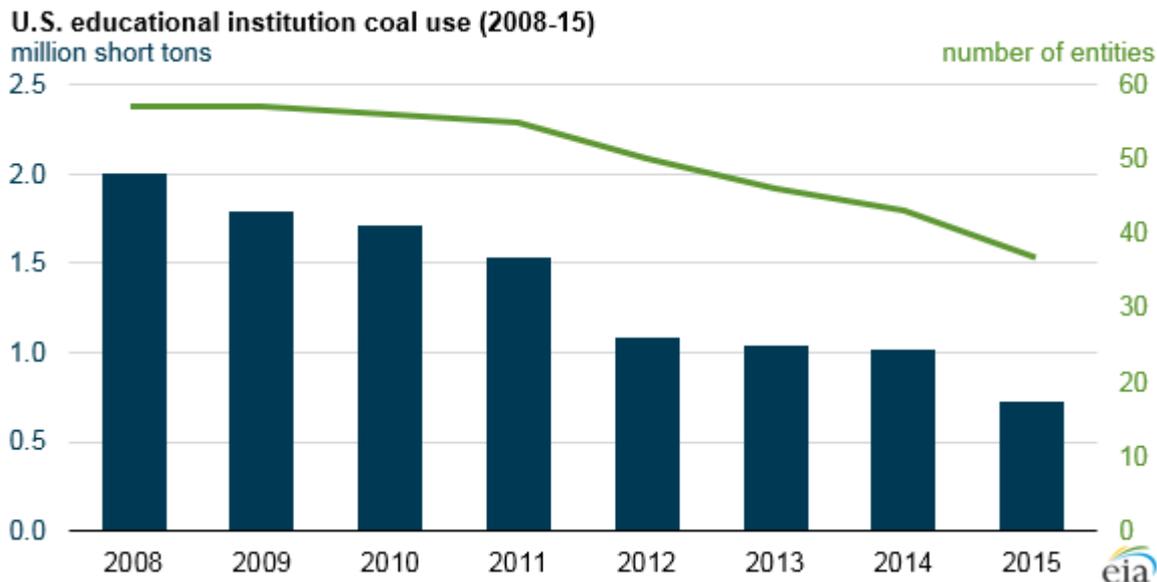


Source: [CoalSwarm, Global Coal Plant Tracker](#) [Get the data](#)

\*状态类别注释：尚未进入审批程序的项目被分类为“宣布”。那些已经开始审批的被归类为“审批前发展”，这些环境许可的被归类为“已审批”。两年或两年以上没有活动的计划，或被赞助人已暂停或取消的，被归类为“搁置”或“取消”。

**Coal consumption by U.S. educational institutions has declined by 64% since 2008**

## Mcanxixun Information

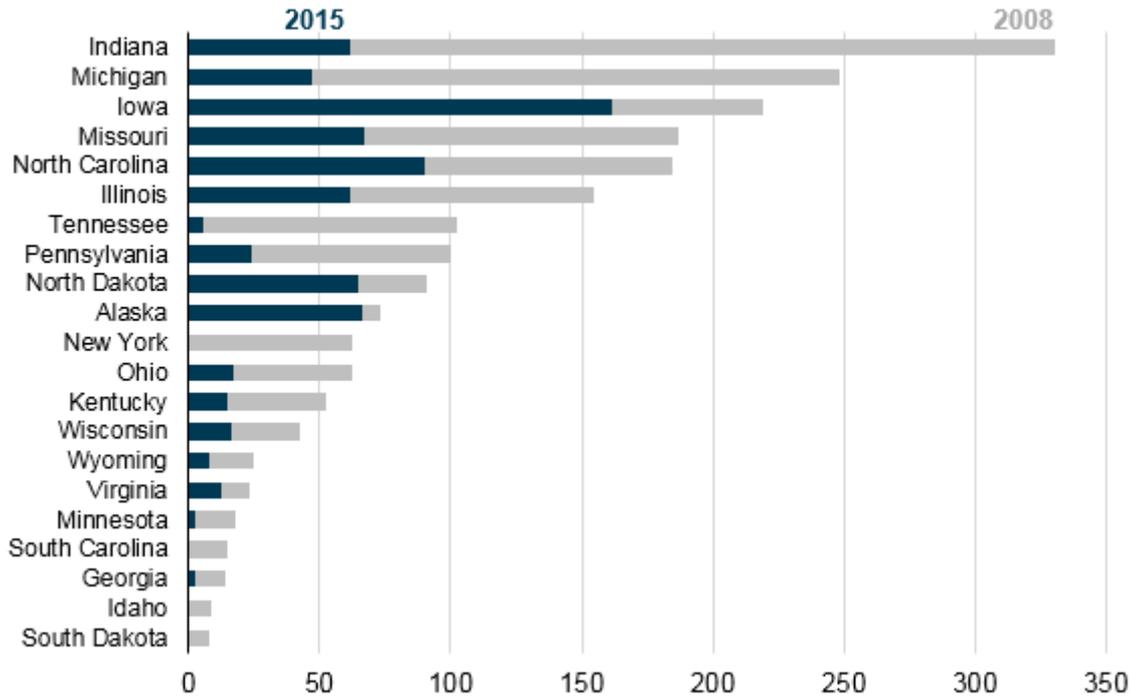


Source: U.S. Energy Information Administration, Quarterly Survey of Non-Electric Coal Data

Coal consumption by educational institutions such as colleges and universities in the United States fell from 2 million short tons in 2008 to 700,000 short tons in 2015. Consumption declined in each of the 57 institutions that used coal in 2008, with 20 of these institutions no longer using coal at all. Many of these institutions participate in the American College and University Presidents Climate Commitment, a program aimed at reducing greenhouse gas emissions. Coal consumption has decreased as institutions switch from coal to natural gas or other fuels.

Coal use at educational institutions is small, making up less than 0.1% of total coal consumption in 2015. But coal use at educational institutions has a long history. Many educational institutions used coal to produce their own electricity and heat as early as the 19th century, when access to the electric grid was limited. The Public Utility Regulatory Policies Act of 1978 allowed many independent power producers, including institutions, to sell their surplus electricity back to public utilities, further encouraging educational institutions to generate their own electricity.

Educational institution coal consumption by state, 2008 and 2015  
thousand short tons



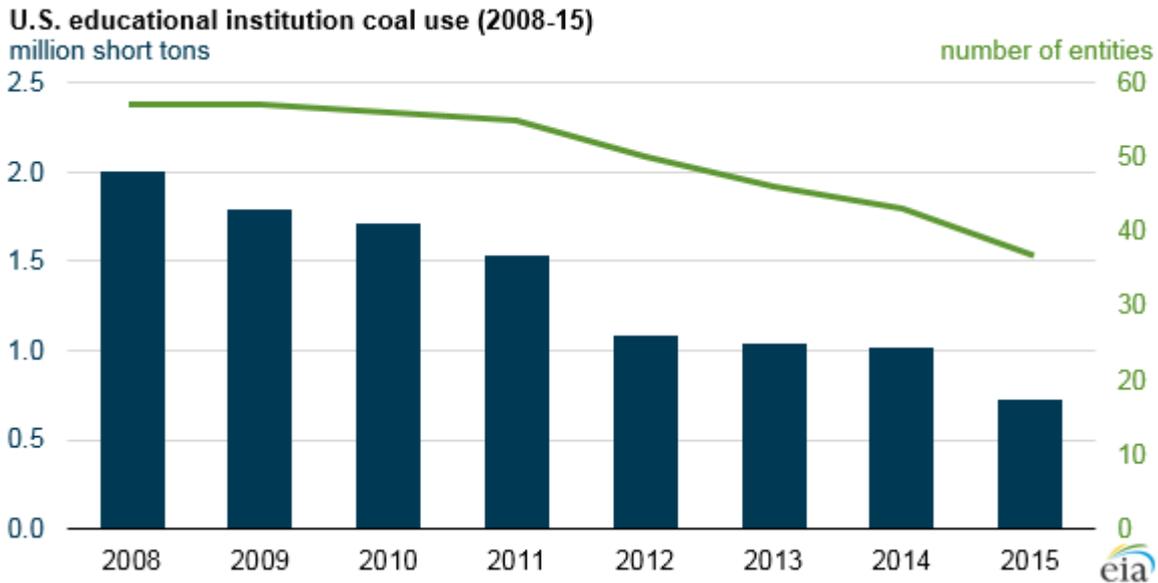
Source: U.S. Energy Information Administration, Quarterly Survey of Non-Electric Coal Data and Power Plant Operations Report

Educational institutions in New York, South Carolina, Idaho, and South Dakota ceased to use coal between 2008 and 2015. These institutions either built or expanded their natural gas capacity, aided by state funding, or increased their electricity purchases from public utilities.

The largest reductions in coal consumption by educational institutions between 2008 and 2015 occurred in Indiana, Michigan, Missouri, and Tennessee. Educational institutions in Indiana collectively reduced coal consumption by 260,000 tons (81%) from 2008 to 2015. Coal was replaced mostly by natural gas and geothermal heat to meet sustainability initiatives set by each university.

Educational institutions in Michigan reduced their coal use by more than 80% over this period, adopting natural gas as the major fuel. Some institutions in Missouri added more renewable sources of power, replacing coal with biomass. Three institutions in Tennessee stopped using coal between 2008 and 2015, resulting in a 94% drop in coal consumption by institutions in the state. Many of their cogeneration plants were converted to burn only natural gas.

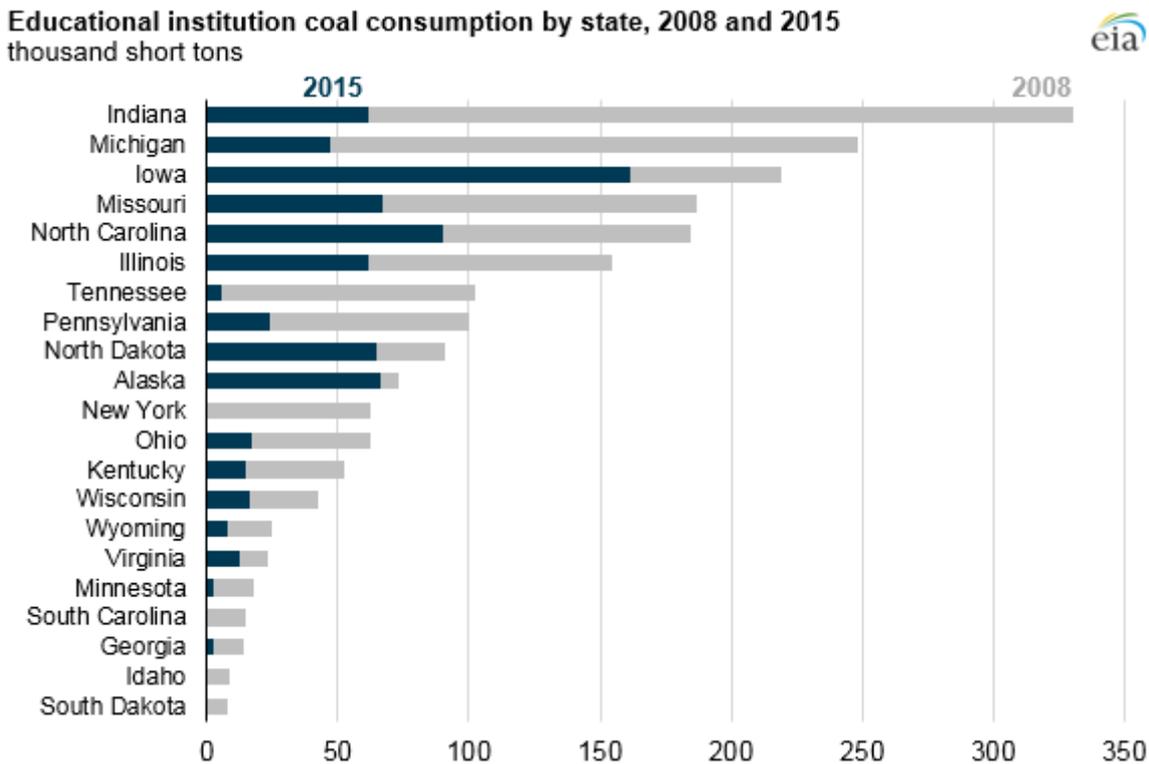
自 2008 年以来，美国教育机构的煤炭消费量下降了 64%



资料来源：美国能源信息管理局，非电力煤炭数据季度调查

美国的教育机构，如美国的学院和大学，它们的煤炭消费量从 2008 年的 200 万吨下降到 2015 年的 700000 吨。在 2008 年使用煤的 57 个机构中的煤炭消耗量都降低了，有 20 个机构根本不再使用煤。许多这些机构都参与了美国学院和大学校长气候承诺，一个旨在减少温室气体排放的项目。随着机构从煤炭转向使用天然气或其他燃料，煤炭的消耗量减少了。

在教育机构的煤炭使用量小，占 2015 年总耗煤量的不到 0.1%。但教育机构的煤炭使用有着悠久的历史。许多教育机构早在第十九世纪就开始用煤产生自己的电力和热量，当时连接电网有限。1978 年的公用事业管制政策法案允许许多独立的电力生产商，包括机构，出售他们的剩余电力给公用事业，进一步鼓励教育机构生产自己的电力。



资料来源：美国能源信息管理局，非电力煤炭数据季度调查和发电厂运营报告

在纽约、南卡罗来纳州、爱达荷州和南达科他州的教育机构在 2008 年和 2015 年之间停止使用煤炭。这些机构得到州立的资金帮助，要么建立，要么扩大天然气的能力，或从公用事业增加他们的电力采购。

教育机构在 2015 年和 2008 年之间的煤炭消耗量最大的减少发生在印第安娜、密歇根、密苏里和田纳西。印第安娜的教育机构总共从 2008 年到 2015 年降低了 260000 吨(81%)的煤炭消费量由 260000 吨(81%)。煤主要是由天然气和地热所取代，以满足每一所大学的可持续发展举措。

在这一时期，密歇根的教育机构减少了 80% 以上的煤炭使用量，采用天然气作为主要燃料。密苏里的一些机构增加了更多的可再生能源，用生物量代替煤。田纳西的三家机构在 2008 年和 2015 年之间停止使用煤炭，导致该州的机构的煤炭消费量下降了 94%。他们的许多热电厂被转换，只燃烧天然气。

## The Challenge of Cutting Coal Dependence

It won't be easy to get rid of coal.

Worried the nation might miss its 2020 target to drastically cut emissions of carbon dioxide, the German government proposed a steep levy last year on the most heavily polluting generators. The tax was intended to deliver a decisive blow against lignite or brown coal, the dirtiest fuel around and Germany's main source of electricity.

Germany views itself as a leader in the push against climate change. It is probably the world's most enthusiastic investor in renewable energy, mainly wind and sun. But even the powerful Chancellor Angela Merkel couldn't quite pull it off.

Facing blowback from labor unions and governments in coal country, Berlin backed off, replacing the levy with a subsidy of 1.6 billion euros to gradually mothball eight coal-fired plants and shut them down permanently by 2023.

Environmentalists hated it. "Instead of being fined for polluting by the proposed new climate levy, utilities will instead get paid for keeping their oldest and most inefficient lignite plants on standby," noted a report for Oxfam on Germany's energy policies by the environmental nonprofit E3G. It "amounts to a golden handshake for utilities at the expense of taxpayers and consumers."

And that wasn't all. The chancellery also rejected a push by Barbara Hendricks, the environment minister, to establish a road map to the total phaseout of coal, hoping to postpone timing decisions until after national elections next year.

Berlin's hesitance may seem like little more than a snag in Germany's vaunted "Energiewende." At least the coal generators are scheduled to shut down eventually.

But the resistance in the greenest of green countries underscores a more substantial challenge to the international effort to drastically reduce fossil fuels in the world's energy supply: workers and retirees, local economies and communities still depend on the fuels the rest of us hope to let go of to preserve the planet for our children and our children's children.

I'm old enough to remember President Jimmy Carter going on TV on April 18, 1977, declaring a "moral equivalent of war" against dependence on foreign oil, and telling Americans that "we need to shift to plentiful coal." It seems unfair to simply tell the communities that worked on this shift: "We're sorry, but it didn't work out."

But making those who will suffer from this transformation whole is not just a matter of fairness. A successful transition to a low-carbon future requires their support. And yet they remain pretty much an afterthought in the public debate over climate change.

Employment in U.S. coal mines has been falling for decades, pushed more by market forces than environmental

## Mcanxixun Information

---

policy. The steep downturn of late is mainly because of a glut in the global steel market and extra-cheap natural gas. President Barack Obama's Clean Power Plan has not yet kicked in, placed on ice by the Supreme Court. Still, Hillary Clinton singled out coal country for government assistance, offering \$30 billion over 10 years.

The stakes are even larger in China. It is the world's largest consumer of coal — burning as much as every other country combined. After years adding coal-fired generators at breakneck speed, the government in Beijing finally acknowledged the public health costs and ordered limits on new construction.

Yet even as environmentalists welcome the decision as a watershed in the transition out of the world's most polluting fuel, striking coal miners have taken to the streets, protesting unpaid wages and government plans to cut 1.3 million coal jobs out of a total of nearly 6 million to reduce overcapacity as the country's growth slows.

There are several reasons to be skeptical about the world's transition out of coal. Sure, official data suggest that the world's production peaked in 2013. China's coal consumption appears to have declined 3.3 percent last year. But experts note that despite the new limits, there are still lots of new coal-fired generators being built.

To protect jobs and tax revenue from small coal mines, Chinese local governments have been known to fib when Beijing has demanded they stop producing coal. They stop reporting production numbers but don't shut them down.

Finally, even the most renewable-friendly nations have not figured out how to draw more than a modest share of their power from wind and sun — which can't be counted on to deliver energy continuously. At the same time, coal remains the easiest and often cheapest source of base power. So from Germany to India, strategies to increase the share of renewable energy in the power mix have relied on a coal base.

“The way many jurisdictions are going is to follow the German model,” said Mark C. Thurber, associate director for research at Stanford University's Program on Energy and Sustainable Development. “It seems totally nuts, but it follows from the fact that renewables have a lot of support, and other than that, people do what they know, which is coal.”

India draws 62 percent of its power from coal and is already the second-largest consumer after China and ahead of the United States. Still, coal consumption is growing about 7 percent a year to power the country's economic catch-up.

“There is not much research into backing out coal with something else,” Thurber said. “They are just throwing renewables at a coal base.” While environmentalists welcomed India's announcement last year that it would increase investment in solar energy, they were less pleased by its plans to triple coal production from 2013 to 2020.

This means the world's climate change strategy cannot rely on the quick replacement of the dirtiest fuel around. Increasing investment in technologies like carbon capture and storage may prove indispensable to meet the limits on carbon dioxide emissions needed to prevent a catastrophic warming over coming decades.

Even after all this is dealt with and the obstacles are overcome, the human dimension will remain.

It will require a lot of attention, and more than a few billion dollars. Simply assuming that displaced coal miners will make a smooth transition into jobs in newfangled energy industries, which have a different geographical footprint and require a different skill set, is a cop-out.

## 向燃煤说再见，没那么容易

要摆脱煤炭没有那么容易。

因为担心德国达不到 2020 年大幅削减二氧化碳排放的目标，该国政府曾在去年提议对污染最严重的发电厂征收高额税费。此举意在给褐煤决定性的一击。褐煤是这里最不清洁的燃料，也是德国电力的主要来源。

德国自认为是推动气候变化方面的领导者。它可能是世界上最热心于投资可再生能源的国家，主要发展风能和太阳能。但就连强悍的德国总理安格拉·默克尔(Angela Merkel)也没能完全实现上述提议。

面对来自工会和煤炭产区地方政府的阻力，柏林退缩了。它放弃征收那项税费，代之以 16 亿欧元（约合 120 亿人民币）的补贴，帮助逐渐淘汰八座燃煤发电厂，并在 2023 年结束前将它们永久关闭。

环境保护主义者非常不喜欢这种结果。“这些造成污染的事业公司非但不会被处以罚金，缴纳新提议的气候税费，反倒可以因为保留自己那些极其老旧和低效的褐煤电站，并暂停其运转而得到补贴，”非营利环保组织 E3G 就德国能源政策为乐施会(Oxfam)制作的一份报告指出。这“相当于用纳税人和消费者的钱给这些事业单位一大笔退休金”。

不仅如此，总理办公室还否决了环境部长芭芭拉·亨德里克斯(Barbara Hendricks)确立彻底废除煤炭燃料的线路图的努力，希望将决策时间推迟到明年的大选之后。

柏林的犹豫看起来似乎不过是德国大肆宣扬的“能源转型”(Energiewende)遇到的一个障碍。至少依计划这些燃煤发电厂最终都会被关闭。

但这个堪称“绿中最绿”的国家所遭遇的阻力，突显出在全球能源供应中大幅减少化石燃料的国际努力面临一个更实质性的挑战：工人和退休人员、仍然依赖这些燃料的地方经济和社区，尽管我们其他人希望放弃它们，以便保护这个星球，让我们的孩子及其后代拥有更好的环境。

我年龄够大，还能记得吉米·卡特 1977 年 4 月 18 日在电视上宣布向美国对外国石油的依赖发起“道义战争”的情形，他告诉美国人“我们需要转向储量丰富的煤炭”。单单告诉这些社群，“对不起，这场战争出了大问题”，似乎不太公平。

但对那些会因这种转变受损的人做出补偿，不只是一个公平问题。成功地迈向低碳的未来需要他们的支持。而在针对气候变化的公开辩论中，他们基本上始终是事后才被想起的群体。

几十年来，美国煤矿的雇佣人数一直在下降，这更多是由市场力量推动，而非环境政策。近来这一数字大幅降低，主要是因为全球钢铁市场供过于求，加上天然气价格格外低廉。美国总统贝拉克·奥巴马还没有开始实施他的清洁电力计划(Clean Power Plan)，因为最高法院做出裁决，要求暂停执行。此外，希拉里·克林顿(Hillary Clinton)单独将煤炭区列出来，提议在 10 年里为它们提供 300 亿美元的政府援助。

中国牵涉其中的利益甚至更大。它是世界上最大的燃煤国，煤炭消耗量相当于其他国家的总和。在多年以非常危险的高速度增加燃煤发电厂之后，北京的政府终于承认这么做的公共卫生代价太大，下令对新建项目进行限制。

然而，就在环保人士对此表示欢迎，将它看作摆脱世界上污染最严重的燃料的努力出现转折之时，罢工的煤矿工人却走上了街头，抗议企业拖欠工资，抗议政府计划削减 130 万个煤炭业工作岗位。当下，中国煤炭业有将近 600 个工作岗位。随着中国经济增长放缓，政府需要削减过剩的生产力。

我们有好几个理由对世界摆脱煤炭资源的可能性持怀疑态度。当然，官方数据显示全球产煤量在 2013 年达到了高峰。中国去年的煤炭消耗量似乎减少了 3.3%。不过专家也指出，尽管政府实施了新的限制，但仍有不少新的燃煤发电站在建设之中。

据悉，为了保住工作机会和来自小煤矿的税收，中国地方政府会在北京要求停止产煤的时候撒谎。他们不再上报生产数据，但却不会关掉煤矿。

最终，就连最支持可再生能源的国家也搞不清楚，如何才能将本国风能与太阳能极低的总发电量占比有所提高。目前还不能指望这两种能源可以实现持续稳定的供应。与此同时，煤炭依然是最容易获得、往往也是最便宜的电力来源。所以不管是在德国还是印度，其增加可再生能源发电比例的策略都要以煤炭电力为基础。

“很多国家的发展方向就是采用德国的模式，”斯坦福大学能源与可持续发展项目(Stanford University's Program on Energy and Sustainable Development)研究部副主任马克·C·瑟伯(Mark C. Thurber)说。“这看似完全疯了，但它出自这样一个事实：很多人对可再生能源表示支持，但除此之外，人们还是会使用自己了解的东西，那就是煤。”

## Mcanxixun Information

---

印度 62% 的电力来自煤，它已经是排在中国之后、美国之前的世界第二大燃煤国。但印度的燃煤量依然在以每年约 7% 的比率增长，这样才能为该国在经济上的奋起直追提供动力。

“目前没有太多有关用别的能源取代煤炭的研究，” 瑟伯说。“他们只是在煤炭资源基础上增加可再生能源。” 尽管环保人士对印度去年宣布的一项举措表示欢迎，即它将增加在太阳能方面的投资，但对于印度提出的在 2013 年至 2020 年间将煤炭产量增加两倍的计划，他们就没那么满意了。

这意味着这个世界应对气候变化的策略，不能依靠快速替换目前污染最严重的燃料实现。对于达到在接下来的几十年里阻止灾难性的气候变暖状况发生所需的碳排放限制，增加在碳捕集与存储等技术上的投资，或许会被证明是不可或缺的。

即便所有这些问题得到解决，障碍被跨越，依然会有人的问题。

它将需要很多关注，不只是投入几十亿美元那么简单。仅仅想到让被取代的煤矿工人顺利实现转型，在新能源行业里找到工作，那简直就是逃避问题，因为能源分布情况不同，也需要不一样的技能。

## Pakistan's coal expansion brings misery to villagers in

### Thar desert

Coal excavation will displace thousands of people already living in poverty and deplete groundwater in a region ravaged by drought, reports Amar Guriro

Thario Halepoto village is located in the Thar desert in south-eastern Pakistan, around 400 kilometres east of the port city of Karachi. You can hear the scream of peafowl and bells sounding around the necks of grazing goats and cow. Women wearing colourful clothes carrying water pitchers on their head between the sand dunes.

Around 1,000 households live in the village, the majority of them part of the Halepoto clan. But life here is about to change, with the arrival of Chinese and Pakistan joint venture to excavate the massive coal deposits that lie beneath the sand and build coal fired power stations to meet Pakistan's energy demands.

Mehmood Halepoto's family has lived in this village for centuries. Like other residents, Halepoto is a herder who ploughs the fields when it rains. In 1990 officials came looking for coal, and found huge deposits under the village.

The Thar desert in Sindh province contains 175 billion tonnes of lignite coal – one of the largest untapped coal deposits in the world. It is also one of the most populated deserts in the world – home to world heritages sites and endangered species. Most of the 91,000 people who live in the Thar desert region live in poverty and are highly vulnerable to extreme weather events. Twenty five per cent of people live within the proposed coal development area. They thought they would benefit, but that has not been the case.

"We were happy, as people told us we would be rich, but now, this has turned into a nightmare and the black gold has become a black snake that is displacing us from our ancestral land," said Mehmood.

It was only in 2015 that work began on the fields, when the Thar coal project was included as part of a string of energy and infrastructure deals signed under the US\$46 billion China-Pakistan Economic Corridor (CPEC). These agreements included eight coal-fired power plants and a 3,000-kilometre network of roads, railways and pipelines to transport oil and gas from Gwadar Port on the Arabian sea to Kashgar, in the northwestern Chinese province of Xinjiang.

See also: Interactive map: China Pakistan Economic Corridor

In December 2015, China approved a US\$1.2 billion (8 billion yuan) investment for surface mining of Thar coal and the establishment of 660 MW power projects. The deposits are divided into 12 blocks, each containing 2 billion tonnes of coal. In the first phase the Sindh provincial government has allocated block II to Sindh Engro

Coal Mining Company (SECMC) to excavate 1.57 billion tonnes of coal and build a 660 megawatt power plant. The plant is expected to send power to the Pakistani national grid by June 2019 and will later be expanded to produce 1,320 MW of power.

A state-owned Chinese company, the China Machinery & Engineering Corporation (CMEC), is providing the machinery and technical support for the excavation of coal, and building and running the power plant. The local company will provide human resources, management and be responsible for the distribution of power. SECMC say the project has created 200 technical jobs and 1,600 menial positions. But locals have been protesting that the company has not even given them the menial jobs. Around 300 Chinese, including the engineers, miners and experts are also working on the site.

### Local fears

The Chinese team have started excavating the first pit. In the first phase SECMC will relocate five villages, which are located in block II, including Thario Halepoto village.

SECMC has started paying villagers for their homes and agricultural land. SECMC's chief executive officer, Shamsuddin Ahmed Shaikh, claims that his company will do all they can to help the villagers.

"We will construct model towns with all basic facilities including schools, healthcare, drinking water and filter plants and also allocate land for livestock grazing," he said.

He said that the company is paying villagers above market prices for their land - 185,000 Pakistani rupees (US\$1,900) per acre. However locals say this price does not take into account its high environmental value and they do not want to be relocated to the new towns, the exact location of which is yet to be decided.

"We [our families] lived in this village for centuries, we spent our childhood here and our forefathers are buried here; to leave all this is very difficult," said Muhammad Hassan Halepoto, a resident of the Thario Halepoto.

"We have dozens of trees on each acre of land. We feed our livestock from these trees even during droughts and also when it rains we plough our lands and get a huge amount from the crops. These lands are our permanent source of livelihood," said one villager.

The villagers will also lose grazing lands to the coal project. The Thar Desert is home to 7 million cows, goats, sheep and camel and provides more than 60% of the milk, meat and leather requirement of Sindh province.

Villagers fear that the project will be an environmental disaster for the desert. The company will cut thousands of indigenous trees to make way for the mining and construction of roads, destroying the local ecology.

A SECMC official said that the company will plant 10 trees for every tree cut. So far the company has planted 12,000 trees in an 18-acre area called the Green Park and more trees will be planted in next two years.

But villagers said that they had been using the leaves of these trees as fodder for their animals and they will have no access to the trees in the park. Also instead of planting indigenous trees, they pointed out, the company is planting alien species like conocarpus, a fast growing type of coastal plant which sucks up a lot of water and will be disastrous for the desert environment.

Locals are afraid that the company will extract huge amounts of groundwater for coal excavation, a region where groundwater level is dropping in some areas by two metres a year and has fallen to 100 metres deep in some place due to prolonged drought. Drought in the desert has led to the death of more than 3,000 children in the past three years, although authorities have admitted only 828 deaths.

Residents of another nearby village Gorano have filed a constitution petition in the court against the mining company. Leela Ram, one of petitioners, said that the mining company will dump wastewater over 2,700 acres of cultivatable land and forest. "This will directly affect 15 major villages with 15,000 people, 200,000 trees will die and all these people will have to migrate from their native villages," said Leela Ram.

SECMC's Shaikh rejected such claims saying his company would only use 1,400 acres for two reservoirs to store

the water extracted during excavation. "It will be natural underground saline water, not toxic or poisonous in any way and it will not affect any village," he claimed.

Pakistan's embrace of coal bucks global trend

Thar coal deposits are lignite, a particularly dirty kind of coal with low energy content. This means a higher quantity of coal needs to be burnt to produce power, which means more carbon emissions. Many countries around the world are reducing power generation from dirty lignite. China itself is closing down many coal based power plants at home, but on other hand it is helping developing countries like Pakistan to mine lignite coal and build new power stations.

At the UN climate summit in Paris, Pakistan pledged to reduce its green house gas emissions by 5%, but at the same time it plans to develop its fledgling coal industry with five new power plants scheduled to start producing electricity by 2018 and many more in the pipeline.

A seven-year-old girl recently filed a case in Pakistan's Supreme Court, with the support of her environmental lawyer father, claiming government plans in the Thar desert will exacerbate climate change and deprive future generations of the right to healthy life. In her case she points to the needs to invest in renewables to overcome the power shortage, rather than dirty coal, since the country is endowed with plenty of sun and wind.

SECMC's Shaikh admitted that lignite is worst form the coal, but he claimed that his company will be using state of art modern technology to collect the fly ash from the coal chimney and dump it in a site that the company will build in the future, thus minimizing the damage from fly ash. His words may be little comfort to the villagers of the Thar desert and the next generation of children growing up in Pakistan today.

## 巴基斯坦扩大煤炭开采让塔尔沙漠村民痛苦连连

由中方支持进行的塔尔沙漠煤炭开采与肮脏能源电厂开发将让当地成千上万的贫困居民背井离乡。同时，已经在干旱天气下岌岌可危的地下水资源也可能就此耗尽。

塔尔罗·海尔波多（Thario Halepoto）村地处巴基斯坦东南部的塔尔沙漠之中，位于港口城市卡拉奇以东大约 400 公里的地方。在这里，你既能听到孔雀争鸣，也会看到挂着铃铛在吃草的山羊与奶牛。妇女们身着艳丽的服装，头顶大水罐从沙丘中间慢慢走过。

这个村子里大概有 1000 多户人家，大多数都属于海尔波多部落的分支。然而，这里的宁静恐怕要被打破。一家中巴合资企业看上了沙漠之下丰富的煤炭储备，并且准备在这里建设大型燃煤电厂，以满足巴基斯坦的能源需求。

马哈茂德·海尔波多（Mehmood Halepoto）一家在这个村子已经住了几个世纪了。就像其他居民一样，海尔波多（Halepoto）是一个牧人，但他也会在雨季的时候耕田。1990 年有政府官员来到这里进行勘探，并在海尔波多村的下面发现了储量惊人的煤炭资源。

信德省塔尔沙漠的褐煤储量高达 1750 亿吨——应该算是目前世界上尚未开采的最大煤田之一。这里不仅是世界上人口密度最大的沙漠地区之一，还有着许多世界文化遗址和濒危物种。塔尔地区的 9.1 万居民中，绝大多数都处于贫困状态，而且很容易受到极端天气影响。而其中有 25% 的人都生活在即将开采的煤田地区。他们本以为自己可以从这次资源开采中受益，然而事实并非如此。

他告诉第三极：“一开始我们很高兴，因为别人都说我们要发财了。但现在一切都像噩梦一样，这些黑色的金子就像黑色的毒蛇一样，要把我们从世代栖息的土地上驱逐出去。”

整个项目 2015 年才正式开始动工。因为正是这一年，总额 460 亿美元的中巴经济走廊(CPEC)规划才正式将塔尔煤炭项目纳入其能源与基础设施建设计划中来。这其中就包括建设 8 座燃煤电厂和 3000 公里的公路、铁路与管道网络，将石油和天然气从阿拉伯海沿岸的瓜达尔港输送到中国新疆西北部的喀什。

2015 年 12 月，中国批复了总价 12 亿美元的塔尔沙漠地表煤炭开采和 66 万千瓦发电站项目建设计划。整个煤炭储区被划分为 12 个区块，每个区块煤炭储量 20 亿吨。在项目第一阶段，信德省政府将区块 II 分

配给了信德省昂国煤炭开采公司（Sindh Engro Coal Mining Company，简称 SECMC），允许后者开采总量 15.7 亿吨的煤炭并建设一座 66 万千瓦的发电站。该电站预计 2019 年 6 月起向巴基斯坦国家电网供电，后期发电总量预计可增至 132 万千瓦。

一家名叫中国机械设备股份有限公司（China Machinery & Engineering Corporation，简称 CMEC）的中国国企将为本次煤炭开采、发电站的建设和运营提供所需设备和技术支持。而当地企业则提供人力资源，并负责管理和电力输配工作。信德省昂国煤炭开采公司（SECMC）表示，这个项目将为当地创造 200 个技术岗位和 1600 个基层岗位。但是，当地居民却抗议称，该公司的基层岗位并没有面向他们招工。包括工程师、开采人员和技术专家在内，却有 300 来名中方员工。

### 当地人的恐慌

中方工程队已经开始对第一个矿井进行开采。在第一阶段，信德省昂国煤炭开采公司将对 5 个目前位于 2 号区块的村庄进行搬迁，其中就包括塔尔罗·海尔波多（Thario Halepoto）村。

信德省昂国煤炭开采公司已经对占用的宅基地和农耕地进行了补偿。该公司首席执行官沙姆斯丁·艾哈迈德·沙伊克（Shamsuddin Ahmed Shaikh）表示，公司将竭尽所能帮助这些村民。

他告诉第三极：“我们将建设一批全新的模范村镇，学校、医疗、饮用水、过滤设备等基础设施一应俱全，而且我们还会开辟专门的牲畜放牧区。”

他说，公司给予村民的土地价格高于市场价，大约为每英亩 18.5 万巴基斯坦卢比（约合 1900 美元）。而当地居民却认为，这个价格并没有将土地本身附加的高环境价值计算在内，而且他们也不愿意被安置到新村镇上去，况且这些村镇的位置到现在还没确定。

塔尔罗·海尔波多（Thario Halepoto）村居民穆罕默德·哈桑·海尔波多（Muhammad Hassan Halepoto）说：“几百年来，我们世代都居住在这个村子里，在这里度过了自己的童年，我们的父辈也都葬在这里。要让我们离开这里实在是太难了。”

一位村民也说：“这里每亩土地上都有我们种的树。即便是干旱季节，我们也可以靠这些树来喂养牲畜。当雨季来临的时候，我们也会耕田，而且收成还不错。这些土地是我们赖以生存的永久资源。”

煤炭项目还会抢占村民们的畜牧用地。塔尔沙漠地区总共养殖了大约 700 万头奶牛、山羊、绵羊和骆驼，为信德省提供了大约 6 成的奶制品、肉制品和皮毛制品。

村民们担心这个项目将会成为塔尔沙漠地区的环境灾难。为了给矿井开采和道路铺设让路，项目建设企业将会砍掉上万棵本土树木，这将对当地生态环境造成毁灭性影响。

信德省昂国煤炭开采公司的一位官员表示，公司每砍伐一棵树木，就会栽种 10 棵新树。截至目前，昂国煤炭已经在格林公园的 18 英亩土地上栽种了 1.2 万棵树，未来两年这一计划还将继续。

但是当地村民说，他们原来一直用这些树的树叶来喂养牲畜，而如今的这个森林公园他们根本就进不去。而且项目企业种植的根本就不是原有的树种，而是类似锥果木一类的外来物种。这个品种是一种生长非常迅速的海岸植物，会吸收大量的地下水，这对于沙漠生态来说简直就是灾难。

由于持续干旱，目前项目规划区有些地方的地下水位已经下降到地下 100 米左右，而有些地区的地下水位则以每年两米的速度迅速下降。当地居民担心，项目公司可能会因为煤炭开采而攫取大量的地下水资源。过去 3 年里，沙漠干旱已经导致当地至少 3000 名儿童死亡，而当局承认的数字仅有 828 名。

而附近格拉诺（Gorano）村的村民则已经通过司法渠道对采矿公司提起申诉。其中一名叫做里拉·拉姆（Leela Ram）的请愿者说，采矿公司将会把污水倾倒在超过 2700 英亩的耕地和森林之中。他说：“15 个大型村庄和 1.5 万居民将直接受到影响，20 万棵树将会因污染而死去，而所有的居民都必须因此而搬离本来居住的村庄。”

昂国煤炭开采公司的沙伊克（Shaikh）对上述指控予以了否认。他说：“项目只会占用 1400 英亩土地，用于修建两个用于储存开采污水的蓄水池。这些水只是天然的地下盐水而已，是无毒无害的，不会影响任何一个村庄。”

逆世界潮流而动：巴基斯坦迎来煤炭使用热潮

塔尔煤田的煤属于褐煤，是一种煤化程度低的高灰煤。也就是说，和普通煤相比，要产生同样的电能就要燃烧更多的褐煤，而相应的碳污染排放也就更多。目前全球很多国家都已经不再使用高灰褐煤发电了。中国国内关停了很多燃煤电厂，但同时却又在帮助巴基斯坦等发展中国家发掘褐煤并建设新的燃煤电厂。

在去年的联合国巴黎气候峰会上，巴基斯坦承诺削减 5% 的温室气体排放。然而与此同时，该国却又在计划发展刚刚起步的煤炭行业，预计在 2018 年前共有 5 座全新的发电厂投入使用，更多项目还在积极筹划之中。

最近，一名 7 岁的女孩在她的环境律师父亲支持下向巴基斯坦最高法院提起了诉讼。她指控巴基斯坦政府的塔尔沙漠开发计划将加剧环境变化，而且也掠夺了巴基斯坦未来多少代人享受健康生活的权利。在这个案例中，这位小女孩指出，应该利用投资可再生能源来应对能源供给不足的问题，而不是把目光放在高灰煤炭上，忽略巴基斯坦得天独厚的太阳能和风能资源

信德省昂国煤炭开采公司的沙伊克（Shaikh）承认，褐煤的确是品质最差的一种煤炭资源，但是他也指出，该公司会利用最先进的技术捕捉回收煤场烟囱中的煤灰。未来，该公司还会修建一处专门用于倾倒煤灰的场所，从而最大程度地减少煤灰飞尘的破坏作用。然而对于塔尔沙漠地区的村民以及未来一代的巴基斯坦孩子们来说，这样的说法好像并没有什么说服力。

## *Electricity* (电力)

### **Canadian Solar using power plant projects as buffer to falling module demand and ASP's**

Silicon Module Super League' (SMSL) member Canadian Solar has retained both PV module shipment and revenue guidance for 2016, despite fears of overcapacity hitting both third party demand and ASP declines as it plans tight inventory control, curtail capacity expansions and use its downstream PV project development business as its overall buffer.

Canadian Solar maintained its guidance for total module shipments to be in the range of 5.4GW to 5.5GW, with approximately 5GW recognized in revenue, primarily as third party module sales. The company also maintained its guidance on revenue at US\$3billion to US\$3.2 billion.

Responding to financial analyst question in its second quarter earnings call Dr. Shawn Qu, chairman and chief executive officer of Canadian Solar noted that PV power plant sales from its balance sheet portfolio could be sold to meet revenue guidance, should customers delay projects to benefit from falling module prices.

“The guidance, let's say \$3.2 billion may include more project asset sales. As we discussed in the past, our solar project asset is our buffer,” noted Dr. Qu in the earnings call. “And those are quality assets and we can turn into cash and turn into revenue. So I think if the module ASP strong, let's say maintained at today's level, then, and if we sell some more solar projects, then our total revenue may exceed the current guidance. However, if the module sales [is] not as strong, let's say, if some customer indeed want to wait until Q1 next year, then the project sale will serve as a buffer, which will help us to fill and achieve our current guidance.

#### Yieldco plans cancelled

The potential move to sell power plant assets is inline with Canadian Solar's decision to cancel plans to establish a publically listed yieldco that had been discussed for over a year as the company built a portfolio of completed projects on its balance sheet that totalled around 472MW at the end of the second quarter with a value of around US\$850.0 million, according to the company.

Recently appointed CFO, Huifeng Chang noted in the call: “This decision came after a prolonged period of waiting for a green light from the market, but the market remains unfavourable and now we have decided to move forward to monetize our assets. And I'm happy to report we have made progresses, for example, in July, we signed agreement to sell two projects in China. And meanwhile, we have been taking multiple approaches to monetize our operating assets in other countries, such as the US, Canada and the UK. We are committed to strengthen our balance sheet.”

### Inventory control

As part of the strategy to weather a downturn, Canadian Solar noted that it was undertaking a tight control of module inventory.

“For example, in Q2, our whole Q2 theme is to control inventory,” noted Dr. Qu in the call. “And as a result, you see that we significantly reduced our inventory from Q1 level to Q2 level, so we are prepared for that. [In] some of our past discussions I mentioned that even in the previous downturn, and the worst of quarters, let's say in 2011 or 2012, right? If you don't have inventory problems, if you don't have that, if you buy the material today, making order, a solid order today, you still make money.”

Inventories at the end of the second quarter of 2016 were US\$309.7 million, compared to US\$413.2 million at the end of the first quarter of 2016. Inventory turnover was 51 days in the second quarter of 2016, compared to 58 days in the first quarter of 2016.

### Financials

Canadian Solar reported second quarter 2016 revenue of US\$805.9 million, up 11.7% from US\$721.4 million in the first quarter of 2016 and up 26.6% from US\$636.7 million in the second quarter of 2015.

The company reported a gross profit of US\$138.5 million, compared US\$112.5 million in the first quarter of 2016 and US\$96.5 million in the prior year period. Gross margin in the second quarter of 2016 was 17.2%, compared to 15.6% in the first quarter of 2016 and 15.2% in the prior year period.

Dr. Qu also noted that module ASPs had trended down since July, while the sequential increase in gross margin was due to lower module manufacturing cost.

### Shipments

Canadian Solar reported second quarter 2016 PV module shipments (recognized in revenue) of 1,290MW, compared to 1,172MW recognized in revenue in the first quarter of 2016. The company had previously guided second quarter guidance in the range of 1,200MW to 1,250MW.

Module shipments included 18.7MW used in Canadian Solar's downstream project business, compared to 24.8MW in the first quarter of 2016 and 90.0MW in the second quarter of 2015.

On a geographical basis sales to the Americas represented 47.6% of net revenue, sales to Asia represented 39.5% of net revenue, and sales to Europe and others represented 12.9% of net revenue, compared to 43.1%, 44.4% and 12.5% respectively, in the first quarter of 2016.

Management noted in the earnings call that that strong market growth was expected in India, Latin America, notably Brazil and that Mexico was a 'bright spot'. Strong market demand in China (20GW) and the US was expected to continue in 2017.

However, management are more cautious over market demand in 2017.

“As long as we are cautious enough and be thoughtful, we build our factories, we should be able to maintain a reasonable utilization rate for our capacities to 2017, 5.8 gigawatts of module capacity we are not going to waste so much of that. But also, as I mentioned, every year, there's high season and low season. In the low season, then for the module, the utilization is now going to be 100%,” noted Dr. Qu.

## 阿特斯阳光电力利用发电站项目作为缓冲

“硅基组件超级联盟”成员阿特斯阳光电力(NASDAQ:CSIQ)尽管担忧产能过剩造成第三方需求和平均销售价格下降,但是由于其计划严格控制库存、缩减产能扩张,并且使用自己的下游光伏项目开发业务作为其整体缓冲,日前保留了2016年光伏组件出货量和收入目标。

阿特斯阳光电力保持其5.4GW至5.5GW的总组件出货量目标,收入确认约5GW,主要是作为第三方组件销售。该公司还保持其收入目标为三十亿美元至三十二亿美元。

在其第二季度收入电话会议中,阿特斯阳光电力董事长兼首席执行官瞿晓铎博士回应财务分析师的问题指出,如果客户推迟项目以获益于不断下降的组件价格,该公司出售其资产负债表投资组合中的光伏电站可以满足收入目标。

瞿晓铎博士在收入电话会议中指出:“该目标,三十二亿美元可能包括更多项目资产出售。正如我们在过去讨论的,我们的太阳能项目资产是我们的缓冲。这些都是优质资产,我们可以转变为现金,转变为收入。因此我认为,如果组件平均销售价格强劲,假设维持在目前的水平,那么如果我们出售更多的太阳能项目,我们的总收入可能超过目前的目标。然而,如果组件销售没有那么强劲,如果一些客户确实要等到明年第一季度,那么项目销售将作为一个缓冲,将帮助我们填补和实现我们当前的目标。”

### Yieldco 计划取消

根据该公司,出售发电站资产的潜在举动与阿特斯阳光电力决定取消建立一个公开上市的yieldco的计划相匹配,该计划已经被讨论超过一年,该公司第二季度末在其资产负债表完成项目约472MW,价值约8.5亿美元。

最近任命的首席财务官Huifeng Chang在电话会议中表示:“这一决定在长期等待市场批准后到来,但是市场仍然不利,现在我们已决定推进货币化我们的资产。我很高兴报告我们取得进展,例如,七月我们签署协议在中国出售两个项目。与此同时,我们已经采取多种方法,在美国、加拿大和英国等其他国家货币化我们的运营资产。我们正致力于加强我们的资产负债表。”

### 库存控制

作为抵御低迷的战略的一部分,阿特斯阳光电力指出,其正在严格控制组件库存。

瞿晓铎表示在电话会议中指出:“例如,在第二季度,我们的整个第二季度主题是控制库存。因此,可以看到从第一季度到第二季度,我们大幅降低库存,因此我们为严格控制库存作准备。在我们过去一些讨论中,我提到,即使在此前的低迷,最糟糕的季度,比方说2011年或2012年。如果没有库存问题,今天购买材料,生成订单,仍然能够赚钱。”

2016年第二季度末库存为3.097亿美元,而2016年第一季度末为4.132亿美元。2016年第二季度库存周转为五十一天,而2016年第一季度为五十八天。

### 财务业绩

阿特斯阳光电力报告,2016年第二季度收入为8.059亿美元,较2016年第一季度7.214亿美元提高11.7%,较2015年第二季度6.367亿美元提高26.6%。

该公司报告,毛利润为1.385亿美元,而2016年第一季度为1.125亿美元,去年同期为九千六百五十万美元。2016年第二季度毛利率为17.2%,而2016年第一季度为15.6%,去年同期为15.2%。

瞿晓铎博士还指出,自七月以来,组件平均销售价格呈下降趋势,而毛利率的连续增长是由于较低的组件制造成本。

### 出货量

阿特斯阳光电力报告,2016年第二季度光伏组件出货量(收入确认)为1,290MW,而2016年第一季度收入确认1,172MW。该公司此前曾预计,第二季度目标为1,200MW至1,250MW。

组件出货量,包括18.7MW用于阿特斯阳光电力的下游项目业务,而2016年第一季度为24.8MW,

2015 年第二季度为 90.0MW。

在地域基础上，对于美洲的销售额占净收入的 47.6%，对于亚洲的销售额占净收入的 39.5%，对于欧洲及其他地区的销售额占净收入的 12.9%，而 2016 年第一季度分别为 43.1%、44.4%和 12.5%。

管理层在收入电话会议中指出，预计在印度、拉丁美洲，特别是巴西出现强劲的市场增长，墨西哥是一个“亮点”。预计中国(20GW)和美国强劲的市场需求在 2017 年将继续。

然而，管理层对于 2017 年的市场需求更为谨慎。

瞿晓铎博士指出：“只要我们足够谨慎并深思熟虑打造我们的工厂，我们应该能够对于 2017 年产能保持合理的利用率，我们不会浪费 5.8GW 组件产能。此外，正如我所说的，每年，都有旺季和淡季。在淡季对于组件，利用率现将达到 100%。”

## **Recurrent Energy's 100MW Mustang Solar Project reaches commercial operation**

Canadian Solar subsidiary Recurrent Energy announced that its 100MW/134 MWp Mustang solar installation in Kings County, California, has reached commercial operation.

Dr. Shawn Qu, chairman and chief executive officer of Canadian Solar, said: "The commercial operation of the Mustang solar project continues a historic year that will see Recurrent Energy complete more than one gigawatt of U.S. solar photovoltaic (PV) projects."

In 2015, Recurrent Energy received a tax equity investment commitment for the Mustang site from U.S. Bancorp Community Development Corporation (USBCDC).

Adam Altenhofen, vice president of USBCDC, added: "High-quality solar projects like Mustang are an important strategic investment for U.S. Bank, which provide jobs to local communities, while delivering clean, reliable energy to the state of California."

Renewable energy generated by the Mustang installation will be sold off under long-term power purchase agreements with Sonoma Clean Power and MCE. The site is expected to produce enough electricity to power around 45,000 homes.

Construction of the 404-hectare project created 450 peak construction jobs. Blattner Energy offered its engineering, procurement, and construction (EPC) services for the project.

## **Recurrent Energy 的 100MW Mustang 太阳能项目实现商业运营**

阿特斯阳光电力(Canadian Solar)旗下子公司 Recurrent Energy 宣布，其位于加州金斯县的 100MW/134 MWp Mustang 太阳能安装项目日前实现商业运营。

阿特斯阳光电力董事长兼首席执行官瞿晓铎博士表示：“Mustang 太阳能项目的商业运营延续了历史性的一年，将看到 Recurrent Energy 完成超过一千兆瓦的美国太阳能光伏项目。”

2015 年，Recurrent Energy 的 Mustang 电站收到 U.S. Bancorp Community Development Corporation(USBCDC)的税收股权投资承诺。

USBCDC 副总裁 Adam Altenhofen 补充道：“高品质太阳能项目，如 Mustang，对于美国银行是一项重要的战略投资，为当地社区提供就业岗位，同时向加州交付清洁、可靠能源。”

Mustang 安装项目产生的可再生能源将根据与 Sonoma Clean Power 和 MCE 的长期购电协议出售。预计该电站产生的电力将足够为约四万五千户家庭供电。

该四百零四公顷的项目的建设，在高峰时段创造四百五十个建筑岗位。Blattner Energy 为该项目提供

设计、采购和施工服务。

# Yingli Green's solar module shipments set to plummet in Q3

Struggling 'Silicon Module Super League' (SMSL) member Yingli Green Energy has reported better than guided module shipments in the second quarter of 2016, due to strong sales in China. However, due to the significant decline in downstream project development in China in the second half of the year, Yingli Green guided shipments could halve in the third quarter.

Yingli Green Energy reported second quarter total PV module shipments of 662MW, exceeding previously raised guidance of 580MW to 620MW, up from 508.1MW in the previous quarter, a 30% increase, quarter-on-quarter.

The company noted that shipments in China increased by around 100%, compared the first quarter of 2016, due to strong downstream PV installations, as a result of at least 18GW being installed in the country ahead of FIT changes at the end of June.

The increased China shipments meant module ASP's were much lower in the quarter. The company reported a gross profit US\$69.2 million, while gross margin declined to 18.2%, compared to 20% in the previous quarter. Gross margin on sales of PV modules was 18.1%.

Yingli Green reported second quarter 2016 revenue of US\$379.8 million, compared to US\$364.6 million in the previous quarter.

Operating income was US\$23.8 million in the second quarter, compared to US\$28.9 million in the first quarter of 2016. Operating margin was 6.3% in the second quarter of 2016, compared to 7.9% in the first quarter of 2016 and negative 6.6% in the second quarter of 2015.

Liansheng Miao, chairman and CEO of Yingli Green Energy said: "We saw robust demand from China in the second quarter of 2016 as PV projects that were operational before June 30, 2016 are entitled to a higher feed-in tariff, and we increased our PV module shipments to China by more than 100% from the first quarter of 2016 by leveraging our cooperative relationships with certain large clients such as state-owned enterprises controlled by central and local governments in China as well as influential privately owned enterprises with strong financial background. Internationally, Japan continued to be the most important international market for us and our shipments to Japan accounted for more than 20% of our total PV module shipments in the second quarter of 2016, which was the seventh straight quarter that our shipments to Japan exceeded 120 MW."

### Shipment decline and impact

Yingli Green noted that module shipments in the third quarter of 2016 would be in the range of 300MW to 400MW, while gross margins would decline further to a range of 12.5% to 14%.

Key challenges with plummeting shipments is the likelihood the company will revert to a net loss for the third and fourth quarters as margin erosion continues on ASP and production utilisation rate declines along with revenue.

Inventory levels have already increased quarter-on-quarter. The company noted that inventory stood at US\$230.2 million at the end of the second quarter, up from US\$219.6 million at the end of the first quarter of 2016.

As result of the expected declines, renewed strains on Yingli Green's fragile liquidity position could emerge. The company had US\$89.8 million in cash and cash equivalents at the end of the second quarter, up from US\$53.1 million at the end of the previous quarter.

Although the company noted some of its subsidiaries in China had been able to partially extend bank loans and gain slightly lower interest rates on those extensions, Yingli Green has remained unable to get agreements on

rescheduling partially defaulted bonds.

## 英利绿色能源第三季度太阳能组件出货量或暴跌

苦苦挣扎的“硅基组件超级联盟”成员英利绿色能源(NYSE:YGE)日前报告，由于在中国销售强劲，2016年第二季度组件出货量高于预期。然而，由于今年下半年在中国下游项目开发的大幅下降，英利绿色能源预计，第三季度出货量可能会减半。

英利绿色能源报告，第二季度光伏组件总出货量为662MW，超过此前上调后的580MW至620MW的目标，较上季度508.1MW季度同比提高30%。

该公司指出，由于在六月底上网电价补贴改变之前在中国至少安装18GW，造就下游光伏安装强劲，在中国的出货量较2016年第一季度提高约100%。

该季度中国出货量的提高意味着组件平均销售价格低得多。该公司报告，毛利润为六千九百二十万美元，而毛利率较上季度20%降至18.2%。光伏组件销售的毛利率为18.1%。

英利绿色能源报告，2016年第二季度收入为3.798亿美元，而上季度为3.646亿美元。

第二季度运营收入为两千三百八十万美元，而2016年第一季度为两千八百九十万美元。2016年第二季度运营利率为6.3%，而2016年第一季度为7.9%，2015年第二季度为负6.6%。

英利绿色能源董事长兼首席执行官苗连生表示：“由于在2016年六月三十日之前运营的光伏项目享有较高的上网电价补贴，2016年第二季度我们看到中国的需求强劲，我们通过利用我们与某些大客户的合作关系，如中国中央和地方政府控制的国有企业，以及具有强大金融背景、具有影响力的民营企业，将对中国的光伏组件出货量较2016年第一季度提高超过100%。从国际上来看，日本对于我们而言，仍是最重要的国际市场，2016年第二季度我们对日本的出货量占我们光伏组件总出货量的20%以上，这是连续第七个季度我们对日本的出货量超过120MW。”

出货量下降和影响

英利绿色能源指出，2016年第三季度组件出货量将为300MW至400MW，而毛利率将进一步下降至12.5%至14%。

出货量暴跌的关键挑战是，由于平均销售价格的利润侵蚀继续，收入伴随产能利用率下降，第三季度和第四季度该公司将可能退回到净亏损。

库存水平季度同比已提高。该公司指出，第二季度末库存达2.302亿美元，较2016年第一季度末2.196亿美元有所提高。

由于预期的下滑，英利绿色能源脆弱的流动资金状况可能重新陷入紧缩。该公司第二季度末现金和现金等价物为八千九百八十万美元，较上季度末五千三百一十万美元有所提高。

尽管该公司指出，一些中国子公司已能够在一定程度上扩大银行贷款，而这些扩展获得稍低的利率，但是英利绿色能源仍无法就重新安排部分违约债券达成协议。

## Conergy to build large-scale solar-plus-battery project in Australia

Conergy plans to build a 10.8MWac solar PV plant combined with 1.4MW/5.3MWh of lithium-ion battery storage near Lakeland, Australia.

The plant has garnered the interest of Melbourne-headquartered mining firm BHP Billiton, which is the largest mining firm in the world, as it considers solar-plus-storage applications for its own remote operations through a knowledge sharing steering committee. Similarly, Ergon Energy is looking to avoid network upgrade costs in

## Mcanxixun Information

---

Queensland through the technology combination.

The Conergy plant will provide energy for more than 3,000 homes and will create 60 jobs during construction. Origin Energy is buying the power from the plant.

The AU\$42.5 million project is scheduled for completion in April 2017 and the Australian Renewable Energy Agency (ARENA) is providing AU\$17.4 million funding.

ARENA chief executive Ivor Frischknecht said: “Figuring out how solar PV and battery storage technologies best work together at a large scale will be crucial for helping more renewables enter our grids.

“Our growing expertise in integrating renewables and batteries could readily translate into economic opportunities including export dollars in world markets.”

Frischknecht said solar-plus-storage is particularly beneficial on the fringe of electricity grids, which can suffer from outages due to network constraints, lack of infrastructure and long distance power lines.

He also said that the project will be a world-first in testing out the concept of ‘islanding’ from the main grid, where the town of Lakeland will be solely powered by solar and batteries for several hours.

A detailed battery testing plan will be implemented over the first two years of operations, culminating in testing ‘island mode’ during the evening peak.

Conergy managing director David McCallum said utility-scale storage and solar with effective management software is the “Holy Grail” of the global renewable energy industry.

## Conergy 拟在澳大利亚建设大型太阳能加电池项目

Conergy 计划在澳大利亚 Lakeland 附近建设一座 10.8MWac 太阳能光伏电站，结合 1.4MW/5.3MWh 的锂离子蓄电池。

该电站获得了总部位于墨尔本的矿业公司 BHP Billiton 的兴趣，这是世界最大的矿业公司，该公司通过一个知识共享的指导委员会，为自己的偏远地区业务考虑太阳能加储能应用。同样，Ergon Energy 正寻求通过技术结合，规避在昆士兰的网络升级成本。

该 Conergy 电站将为超过三千户家庭提供能源，在建设期间将创造六十个就业岗位。Origin Energy 将从该电站购买电力。

预计该价值四千两百五十万澳元的项目将于 2017 年四月竣工，澳大利亚可再生能源局(ARENA)正在提供一千七百四十万澳元资金。

ARENA 首席执行官 Ivor Frischknecht 表示：“确定太阳能光伏和电池储能技术最佳的大规模合作的方式，对于帮助更多可再生能源进入我们的电网至关重要。”

“我们在整合可再生能源和电池中日益增长的专业知识，可以很容易地转化为经济机会。”

Frischknecht 表示，太阳能加储能电网方面特别有益，电网由于网络限制、缺乏基础设施以及长距离输电线，可能会遭受中断。

他还表示，该项目将是世界首次测试“孤立于”主电网的概念，Lakeland 镇将完全由太阳能和电池供电数小时。

一个详细的电池测试计划将在运营前两年实施，晚高峰“孤立模式”的测试达到高潮。

Conergy 总经理大卫·麦考伦(David McCallum)表示，利用高效管理软件的公共事业规模储能和太阳能，是全球可再生能源行业的“圣杯”。