# ENERGY

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***Vol.151,2016***

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# *Oil（石油）*

## Kazakhstan acts after Romania blocks oil deal

Kazakhstan's state oil company has initiated legal proceedings against Romania after prosecutors froze its shares in the country's largest oil refinery, disrupting plans to sell a controlling stake to a Chinese company.

KazMunaiGas submitted a "notice of investment dispute" — the first step in a legal process that could lead to international arbitration — to the Romanian government, according to a letter from the company's lawyers seen by the FT.

The dispute is the latest obstacle for Kazakhstan's ambitious privatisation programme, which was announced last year with much fanfare but has made little progress.

KazMunaiGas in late April agreed to sell a 51 per cent stake in KazMunaiGas International, the subsidiary that owns the Petromidia refinery in Romania, to CEFC, a private Chinese company, for $680m.

But only days later, Romania's Directorate for the Investigation of Organized Crime and Terrorism (DIICOT), a unit of the public prosecutor's office, named KazMunaiGas as a party in a corruption probe into the privatisation of the refinery in the early 2000s and froze its assets.

"Romania is using its governmental power to undermine that transaction and renationalise the assets," KazMunaiGas lawyers said in the letter to the Romanian government.

## 哈萨克国有石油公司起诉罗马尼亚政府

此前罗马尼亚检察官冻结了该公司在罗马尼亚最大炼油厂股权，破坏将控股权出售给一家中国公司的6.8亿美元交易。

哈萨克斯坦国家石油和天然气公司(KazMunaiGas)对罗马尼亚启动法律程序，此前检察官冻结了该公司在罗马尼亚最大炼油厂的股权，破坏了将控股权出售给一家中国公司的计划。

根据哈萨克斯坦国家石油和天然气公司律师的一封信，该公司向罗马尼亚政府递交了一份"投资争端通知"，这是可能导致国际仲裁的司法程序的第一步。英国《金融时报》看到了这封信。

这一争端是哈萨克斯坦雄心勃勃的私有化计划的最新障碍，去年，哈萨克斯坦大张旗鼓地宣布了私有化计划，但进展甚微。

今年 4 月下旬，哈萨克斯坦国家石油和天然气公司同意以 6.80 亿美元将其子公司 KazMunaiGas International 的 51%股权出售给中国私营企业华信能源(CEFC)。KazMunaiGas International 是罗马尼亚Petromidia 炼油厂的所有者。

但仅仅几天后，罗马尼亚政府检察官办公室下属的有组织犯罪和恐怖主义调查司(Directorate for the Investigation of Organized Crime and Terrorism)就将哈萨克斯坦国家石油和天然气公司列为一桩针对2000年代初该炼油厂私有化的腐败调查的当事人，并冻结了其资产。

哈萨克斯坦国家石油和天然气公司律师在写给罗马尼亚政府的这封信中表示："罗马尼亚正利用政府权力破坏这笔交易，并将相关资产再度国有化。"

## Shell misses expectations as profits plunge 72 per cent

Profits at Royal Dutch Shell fell by 72 per cent in the second quarter as continued weakness in oil and gas prices weighed on the Anglo-Dutch group.

The results were much worse than market expectations and will add to the gloom hanging over the industry after weak numbers from BP and Statoil earlier in the week and a renewed dip in oil prices below $45 per barrel.

Shell's steep drop in earnings was especially disappointing for investors because it was the first full quarter after completion of its £35bn takeover of BG Group.

Shares in Shell fell 3.1 per cent to £19.80 after the results on Thursday morning.

The addition of BG assets helped lift production by 28 per cent to 3.508m barrels of oil equivalent per day. But this was offset by depreciation charges related to the deal as well as the weak market conditions.

On a current cost of supplies basis — the measure most closely watched by analysts — second quarter earnings were $1.05bn, down from $3.76bn in the same period last year. Analysts' consensus forecast had been for $2.2bn.

Ben van Beurden, chief executive, said low prices "continue to be a significant challenge across the business", particularly in upstream production. But he insisted integration of BG was going well, while cost cuts were improving underlying performance.

There was some comfort for shareholders from a quarterly dividend of 47 cents — unchanged from last year. But the financial strain on Shell was evident in the rise in its debt leverage ratio from 12.7 per cent at this time last year to 28.1 per cent now, mainly as a result of the BG acquisition.

Mr van Beurden has committed to a $30bn asset disposal plan to offset the cost of the BG deal but Shell admitted last month that the process could be delayed because of the pressure from low oil prices on asset prices.

Shell said on Thursday that capital expenditure for the full year would be $29bn, compared with combined investment of $47bn by Shell and BG in 2014 — highlighting the squeeze being placed on the group.

"We are managing the company through the down-cycle by reducing costs, by delivering on lower and more predictable investment levels, executing our asset sales plans and starting up profitable new projects," said Mr van Beurden.

# 壳牌石油二季度利润大幅下挫 72%

壳牌石油二季度利润远低于市场预期，油价低迷以及收购英国天然气集团对该集团造成沉重影响。

荷兰皇家壳牌(Royal Dutch Shell)第二季度利润下降 72%，石油和天然气价格的持续疲软对这家英荷集团造成了严重影响。

该结果较市场预期相差甚远，还会加重笼罩着该行业的阴霾，本周早些时候英国石油(BP)和挪威国家石油公司(Statoil)发布了疲软数据，此外油价再度探底，每桶价格不到 45 美元。

壳牌盈利大幅下跌尤其令投资者失望，因为这是壳牌完成对英国天然气集团(BG Group)350 亿美元收购后的第一个完整季度。

周四上午该消息公布后，壳牌股价下跌 3.1%，至 19.80 美元。

英国天然气集团的加入将壳牌产量提升了 28%，至每天 350.8 万桶石油当量。但这一提升被此笔交易相关折旧费以及疲软的市场环境抵消。

基于当前供应成本——分析师最关注的数据——二季度盈利为 10.5 亿美元，去年同期为 37.6 亿美元。分析师此前普遍预期为 22 亿美元。

壳牌石油首席执行官范伯登(Ben van Beurden)表示油价低"依然对整个行业形成显著挑战"，尤其是对上游生产。但他坚称对英国天然气集团的整合进展顺利，同时成本削减也提高了基本业绩。

股东的季度股利为 47 美分，与去年持平，让股东得到了一些安慰。但壳牌资金紧张明显表现在债务

杠杆比率的上升，去年此时为 12.7%，现在升到 28.1%，这主要是收购英国天然气集团所致。

范伯登已承诺计划剥离 300 亿美元资产，以抵消收购英国天然气集团的成本。但壳牌上个月承认由于低油价对资产价格施加的压力，该计划可能被延迟。

壳牌周四表示全年资本开支预计 290 亿美元，壳牌与英国天然气集团 2014 年共投资 470 亿美元，两相对比凸显壳牌集团负担沉重。

范伯登表示："我们正设法让公司度过下降周期，方式包括降低管理成本，实现较低的、更可预测的投资水平，执行我们的资产出售计划，并展开利润丰厚的新项目。"

# *New Energy（新能源）*

## India doubling solar park capacity to 40GW – Upendra Tripathy

India is expected to approve a doubling of its solar parks policy to reach 40GW capacity by 2020 in the next two months, according to key figure at the Ministry of New and Renewable Energy (MNRE).

The minstry had last approved a total of 33 solar parks in 21 states with a total capacity of 19.9GW in February.

Reuters reported new comments from Upendra Tripathy, MNRE secretary, who said: "We are adding 25 more solar parks to create a buffer for exigencies like SunEdison. Solar parks are a hit with companies. A lot of them are interested."

Bankrupt SunEdison, which had a large pipeline of PV projects in India, including 500MW at a tariff of INR 4.63/kWh in Andhra Pradesh, has caused some concerns for the industry although major companies including Indian conglomerate Adani and Finland-based power giant Fortum have been earmarked as potential buyers of SunEdison's India assets. It remains to be seen if any firm is willing to take on the Andhra Pradesh capacity at such a low tariff.

The government assists PV developers with the solar parks policy by identifying and acquiring all the necessary land as well as setting up transmission lines for a specific off-taker.

When asked whether there is an issue with some solar parks being more expensive for developers than when not using solar parks, Jasmeet Khurana, associate director, consulting, Bridge to India, told PV Tech: "There is a trade-off. When the government does it, it will be slightly more expensive, but then the risk is on the government and not on the developers and then they price it accordingly.

"In fact solar park bids have actually been at lower tariffs than non-solar park bids in some cases even though solar park is a bit more expensive. [...] The government thinks it is a huge success and I don't think they will be working at the pricing per se."

Last month the World Bank approved its largest ever solar loan of US$1 billion set to aid the Indian sector, of which US$200 million will be used to support internal infrastructure in solar parks and another loan amount to be used by state-owned transmission and utilities firm Power Grid Corporation to help support transmission from solar parks.

## 印度翻倍太阳能园区装机容量至 40GW

根据新能源和可再生能源部(MNRE)的关键人物，预计未来两个月，印度将批准翻倍其太阳能园区的政策，到 2020 年实现 40GW 装机容量。

二月，该部批准在二十一个邦总计三十三个太阳能园区，总计装机容量 19.9GW。

路透社报道 MNRE 部长 Upendra Tripathy 的新评论，他表示："我们正在增加二十五个太阳能园区，为 SunEdison 等紧急情况创造一个缓冲区。太阳能园区受到企业欢迎。很多企业感兴趣。"

破产的 SunEdison，在印度拥有大量光伏项目储备，其中包括在安得拉邦 500MW，价格为每千瓦时 4.63 印度卢比，日前引起对于该行业的一些担忧，尽管大公司，其中包括印度企业 Adani 和芬兰电力巨头 Fortum，被指定为 SunEdison 印度资产的潜在买家。但是否有公司愿意以如此低的价格承担该安得拉邦装机容量还有待观察。

政府通过确定和收购所有必要土地，以及为特定承购商建立输电线，利用太阳能园区政策协助光伏开发商。

当问及对于开发商而言，一些太阳能园区比不使用太阳能园区更为昂贵，是否存在问题时，咨询公司 Bridge to India 的副总监 Jasmeet Khurana 在接受 PV-Tech 采访时表示："存在一定的权衡。当政府这样做时，会稍微贵一点，但是风险在政府，而不是在开发商，他们可以相应地定价。"

"事实上，即使太阳能园区稍微贵一点，但是在某些情况下，太阳能园区竞标实际上比非太阳园区竞标价格低。(.....)政府认为，这是一项巨大的成功，我认为他们本身并非致力于该定价。"

上个月，世界银行批准其有史以来最大的太阳能贷款，十亿美元将援助该印度行业，其中两亿美元将用于支持太阳能园区的内部基础设施，其他贷款将被国有传输和电力公司 Power Grid Corporation 用于帮助支持太阳能园区的传输。

# Vivint Solar and Renovate America partner on rooftop solar offering

US-based residential PV provider Vivint Solar and financing firm Renovate America are partnering on a scheme to help US homeowners get access to rooftop solar.

Renovate America is a leading provider of residential Property Assessed Clean Energy (PACE) financing. Vivint is now offering Renovate America's Home Energy Renovation Opportunity (HERO) program, which also helps finance solar and energy efficiency systems, as its PACE financing option.

Homeowners will be able to use HERO financing to purchase Vivint Solar systems and pay for them over time through their local property taxes. Payments are made at a fixed interest rate for terms of 5-20 years, and the interest on the payments may be tax deductible. Meanwhile, should the original residents move out of the property, any remaining balance on the assessment may transferable to any new home owners.

Vivint is now rolling out the HERO Program throughout California. Both companies are also working with state and local governments to expand their product offering nationwide.

Thomas Plagemann, executive vice president of capital markets at Vivint Solar, said: "We are excited to work together with Renovate America to provide this innovative solar financing product that will make solar available to a wider range of consumers, including those who either do not have the upfront capital for a solar energy system or for whom traditional loans, Power Purchase Agreements or Solar System Lease Agreements are not viable options."

## Vivint Solar 与 Renovate America 就屋顶太阳能计划取得合作

美国住宅光伏供应商 Vivint Solar 与融资公司 Renovate America 正在就一个计划取得合作，旨在帮助美国房主获得屋顶太阳能。

Renovate America 是住宅资产评估性清洁能源(PACE)融资的主要供应商。Vivint 现正在提供 Renovate America 的 Home Energy Renovation Opportunity (HERO)计划，该计划作为 PACE 融资方案，还有助于为太阳能和能源效率系统融资。

房主将能够使用 HERO 融资购买 Vivint Solar 系统，并且随着时间发展通过当地财产税为这些系统支付。支付为固定利率为期五至二十年，支付的利息可以免税。与此同时，如果原有居民搬出该房产，该估价的余额可以转让给任何新业主。

Vivint 现正在整个加州推展 HERO 计划。两家公司还与各州和地方政府合作，在全国范围内扩大其产品供应。

Vivint Solar 资本市场执行副总裁 Thomas Plagemann 表示："我们很高兴与 Renovate America 合作，提供这一创新的太阳能融资产品，其将使太阳能可用于更广泛的消费者，其中包括没有前期资金用于太阳能系统，传统贷款、购电协议或太阳能系统租赁协议对于他们并非可行的消费者。"

# India sanctions plans for 10 'Solar Zones' of at least 10,000 hectares each

India has sanctioned plans to implement 10 'Solar Zones' each consisting of at least 10,000 hectares of land to encourage solar PV project developers, manufacturers and investors to help achieve the country's massive 100GW by 2022 solar targets.

The unprecedented scheme, which will run for five years from 2016/17 to 2020/21 using government or privately-owned wasteland, uncultivable land or fallow land, will receive INR440 million (US$6.5 million) of Central government funding. The zones will be able to cover more than one patch of land at a time. To count as a solar zone, it must be possible to install transmission systems in an economically feasible manner on site.

The difference between Solar Zones and Solar Parks is that the Government will only facilitate the purchase of land for the zones, but will not actually acquire it. Furthermore, instead of having transmission provided, solar zones will have several interconnection points set up in a manner that prevents any developer from having to build a line for more than 25 kilometres.

A letter to the Ministry of the New and Renewable Energy (MNRE) from Devendra Singh, under secretary to the government, explained that the zones will help individual states reach their Renewable Purchase Obligations (RPO), which is a mandate for them to purchase a certain percentage of their energy mix from renewable sources. The zones will also drive investment and employment with an aim to decrease reliance on expensive conventional power plants.

Solar Energy Corporation of India (SECI) will develop the zones in collaboration with state governments and their agencies. All states are eligible to benefit from the scheme.

State government's wishing to participate must identify land with insolation of more than 4kWh/sqm and commission a techno-economic feasibility report.

The letter explained the value of keeping solar projects in close proximity to avoid the added costs of smaller, spread-out systems in terms of site development, transmission losses, extra transmission infrastructure and procurement of water among other expenses.

The land will be able to demonstrate synergies with other technologies such as wind and solar hybrids. Indicative allocations of the land were provided, but they are subject to change:

?25% for manufacturers of ingots, wafers, cells and modules as part of the ‘Make in India’ scheme.

?25% for small and medium enterprises, farmers and unemployed youth

?50% for solar project developers

Just yesterday, PV Tech reported India’s plans to double its solar parks policy to hit 40GW capacity by 2020 in response to its slow-moving rooftop sector and concerns over SunEdison’s capacity, which is currently in limbo following the company’s bankruptcy three months ago.

MNRE first announced plans to bring in Solar Zones last November along with major plans for floating PV.

## 印度批准十个“太阳能区域”计划

印度日前批准计划实施十个“太阳能区域”，各自包含至少一万公顷的土地，鼓励太阳能光伏项目开发商、制造商和投资者帮助实现该国到 2022 年巨大的 100GW 太阳能目标。

该空前的计划，将运行五年，从 2016/17 年至 2020/21 年，利用政府或私人持有的荒地、未经耕种的土地或休耕地，将获得 4.4 亿印度卢比(六百五十万美元)的中央政府资助。这些区域将能够一次涵盖超过一块土地。为了视为一个太阳能区域，其必须能够在现场以一种经济上可行的方式安装输电系统。

太阳能区域和太阳能园区的不同之处在于，政府只会帮助各区域购买土地，但将不会实际上购买。此外，并非提供输电系统，太阳能区域将以一种阻止任何开发商必须建立一条超过二十五公里输电线的方式，设置几个互连点。

政府副秘书长 Devendra Singh 致信新能源和可再生能源部，解释这些区域将帮助各个邦达到其可再生能源购买义务(RPO)，RPO 是对于他们的能源结构需购买一定比例可再生能源的命令。这些区域还将推动投资和就业，旨在减少对于昂贵传统发电站的依赖。

印度太阳能公司(SECI)将与各邦政府及其机构合作，开发这些区域。所有邦都有资格从该计划中获益。

希望参与的各邦政府必须明确土地的日照超过每平方米四千瓦时，并且提交一份技术经济可行性报告。

这封信解释了保持太阳能项目彼此靠近的价值，以避免较小、分散的系统在电站开发、输电损耗、额外输电基础设施、水获取及其他费用方面增加成本。

土地将能够证明与其他技术，如风能和太阳能混合动力系统的协同作用。表明提供土地的配置，但或许有所更改：

25%针对硅锭、硅片、电池和组件的制造商，作为“印度制造”计划的一部分

25%针对小型和中型企业、农民和无业青年

50%针对太阳能项目开发商

就在昨天，PV-Tech 报道，印度计划批准翻倍其太阳能园区的政策，到 2020 年实现 40GW 装机容量，以回应其迟缓不进的屋顶领域，以及对于 SunEdison 装机容量的担忧，该公司在三个月前破产后目前处于不稳定的状态。

MNRE 最初在去年十一月宣布引进太阳能区域的计划，伴随着对于浮动式光伏的主要计划。

# Indian oil firms plan 1GW solar plant in Madhya Pradesh to power refineries

Indian Oil Corporation and Oil India are planning to set up a 1GW solar energy plant in the state of Madhya Pradesh in order to power their oil refineries, according to a senior figure of the state’s renewable energy agency.

It is premature to discuss timelines but the two Indian firms are working together and the agency is considering a joint venture with them, Manu Srivastava, managing director of Madhya Pradesh Urja Vikas Nigam, the state's renewables agency, told PV Tech.

He said that the oil giants are going solar as it would be cheaper than conventional energy generation as well as being a commitment to green energy. It may also relate to fulfilling Renewable Purchase Obligations (RPO). The PV capacity will be installed in a solar park.

Srivastava added: “Some oil and gas companies have invested in standalone projects in wind and so on, […] but this is the biggest project of its kind.”

The last year has seen several India-based heavy industry, mining and fossil fuel companies enter the Indian solar energy space including: Coal India Limited (CIL), Neyveli Lignite Corporation (NLC), Adani, Steel Authority of India and Aditya Birla Nuvo.

Steel giant ArcelorMittal planned to build a 500-600MW solar plant in Karnataka after it backed out from plans to build a six million tonnes per annum steel mill. Meanwhile, RattanIndia Power planned to use a 324 hectare site in Punjab, originally pegged for a thermal power plant, to build a 200MW solar PV project.

Just Yesterday PV Tech also reported National Aluminium Company Limited (NALCO) tendering for a 20MW PV plant in Madhya Pradesh.

## 印度石油公司规划位于中央邦的 1GW 太阳能电站

根据中央邦可再生能源机构的高层人士，Indian Oil Corporation 和 Oil India 正计划在中央邦设立一座 1GW 太阳能电站，旨在为其自己的炼油厂供电。

中央邦可再生能源机构 Urja Vikas Nigam 的总经理 Manu Srivastava 在接受 PV-Tech 采访时表示，讨论时间表还为时过早，但这两家印度公司正在合作，并且该机构也正在考虑与他们设立一家合资企业。

他表示，由于太阳能将比传统能源发电更便宜，并且作为对绿色能源的一种承诺，两家石油巨头正向太阳能进军。其可能还涉及履行可再生能源购买义务(RPO)。光伏装机容量将安装在一个太阳能园区。

Srivastava 补充道：“一些石油和天然气公司已投资于风能等独立的项目，(.....)但是这是此类最大的项目。”

过去的一年看到几家印度重工业、采矿和化石燃料公司进军印度太阳能领域，其中包括 Coal India Limited(CIL)、Neyveli Lignite Corporation(NLC)、Adani、Steel Authority of India 和 Aditya Birla Nuvo。

钢铁巨头 ArcelorMittal 在退出每年钢厂生产六百万吨钢的计划后，计划在卡纳塔克邦建立一座 500-600MW 太阳能电站。与此同时，RattanIndia Power 计划利用旁遮普最初计划用于热电厂的三百二十四公顷土地，来建设一个 200MW 太阳能光伏项目。

日前 PV-Tech 还报道，National Aluminium Company Limited(NALCO)为中央邦一座 20MW 光伏电站招标

# Indian mining firm tenders for 20MW solar in Madhya Pradesh

Indian state-owned mining, metal and power firm National Aluminium Company Limited (NALCO) is tendering for the setting up of a 20MW solar PV project in the state of Madhya Pradesh.

The tender will close on 14 September 2016.

The predominantly aluminium-based mining firm, which has mines in Odisha and Andhra Pradesh, has started an energy diversification plan by venturing into renewable energy. The company has successfully commissioned two wind power plants including a 50.4MW wind power plant at Gandikota, Andhra Pradesh and another of 47.6MW wind power plant at Jaisalmer, Rajasthan, which have both been operational since December 2012 and January 2014 respectively.

NALCO also has a 260kW rooftop solar PV system at Bhubaneswar.

The government of India holds 80.93% equity of NALCO.

## 印度矿业公司在中央邦招标 20MW 太阳能

印度国有矿业、金属和电力公司 National Aluminium Company Limited(NALCO)，正在为在中央邦建立一个 20MW 太阳能光伏项目招标。

此次招标的截止日期为 2016 年九月十四日。

该主要以铝为基础的矿业公司，在奥里萨邦和安得拉邦拥有矿产，日前通过进军可再生能源开始一个能源多元化计划。该公司已经成功投产两座风能发电站，位于安得拉邦 Gandikota 的 50.4MW 风能发电站和位于拉贾斯坦邦 Jaisalmer 的 47.6MW 的风能发电站，两座电站分别于 2012 年十二月和 2014 年一月投入运营。

NALCO 在布巴内斯瓦尔还拥有一个 260kW 屋顶太阳能光伏系统。

印度政府持有 NALCO 80.93%的股权。

# PV manufacturing capacity expansion announcements fall significantly in May

PV Tech’s preliminary analysis of global PV manufacturing capacity expansion announcements in May 2016 fell significantly for the first time this year.

May revealed just over 4GW of planned future expansions of thin-film module, solar cell and module assembly production, as well as fully integrated (wafer/cell/module) new capacity, compared to nearly 9GW of planned future expansions in the previous month.

The decline ends a strong consecutive monthly increase since February, 2016, which was around 50% higher than in the same period in 2015.

A total of seven companies announced expansion plans in May, compared to 13 in April.

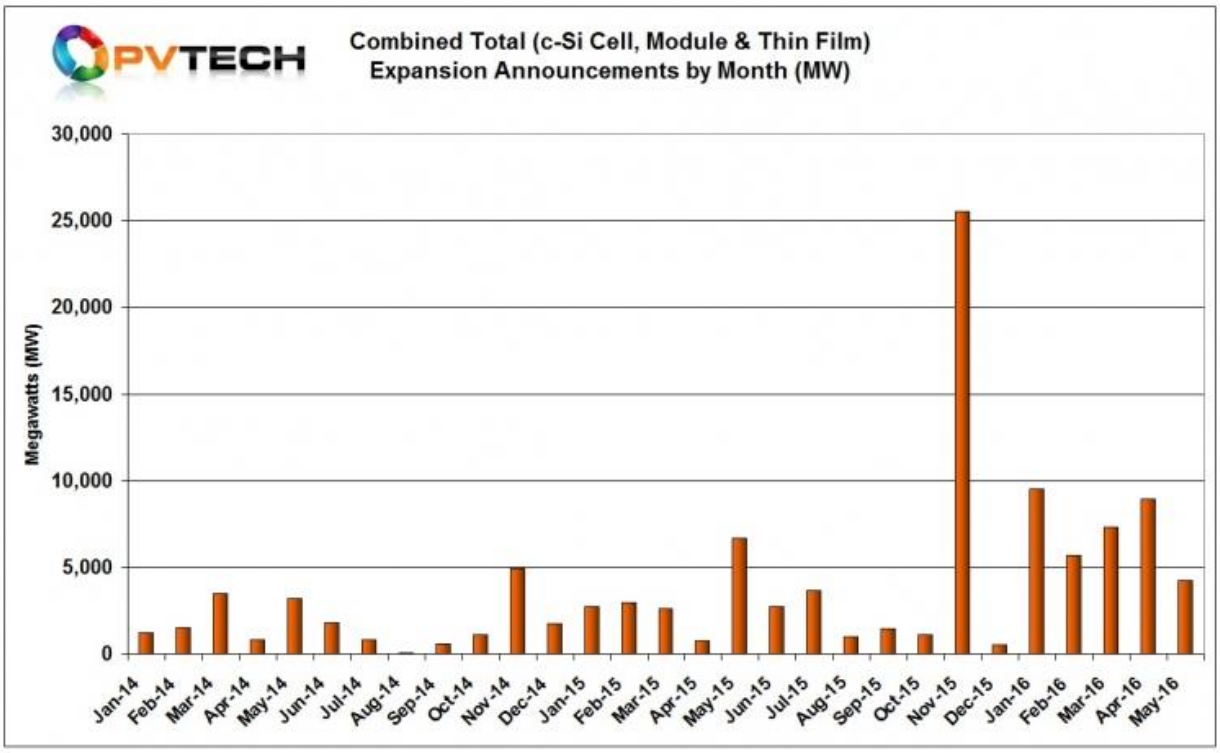
Once again, the absence of major expansions from the ‘Silicon Module Super League’ members and some China-based manufacturers cautiously extending their footprints outside China, kept overall planned capacity expansions low, relative to the previous months of 2016.

This also resulted in the absence of any silicon-based capacity expansions being announced in China, although Canadian Solar and Hareon Solar were responsible for small capacity expansion plans in South East Asia and Morocco, respectively.

Several speculative announcements were also made in May, including big ambitions in Iran and India, though initial expansion phases were small and did not carry timelines to execution. Discounting these plans, announcements slumped by around a further 2GW in May.

Dedicated solar cell capacity expansions totalled 1,340MW in May, compared to 3,750MW in the previous month,

which included a 160MW expansion of monocrystalline capacity in South Korea by Shinsung Solar Energy.




May revealed just over 4GW of planned future expansions of thin-film module, solar cell and module assembly production, as well as fully integrated (wafer/cell/module) new capacity, compared to nearly 9GW of planned future expansions in the previous month.

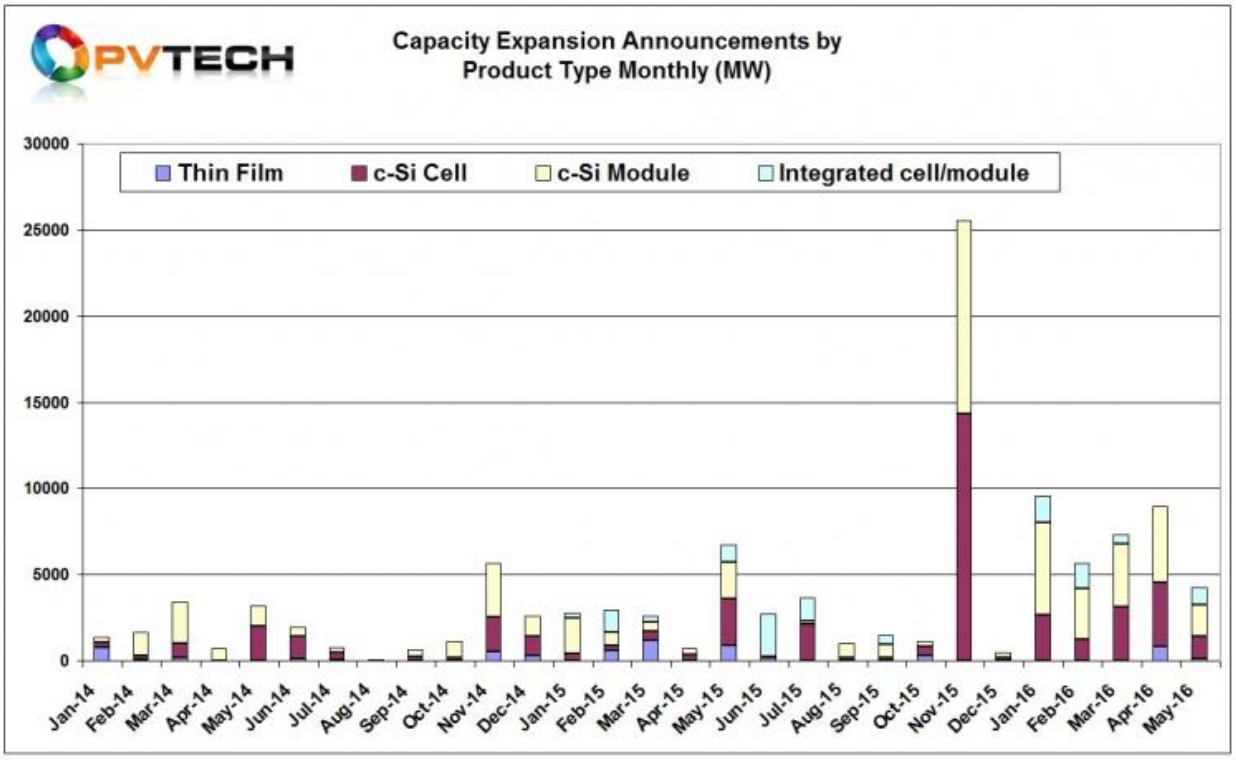
Dedicated PV module capacity expansion announcements reached 1,800MW in May, down from 4,385MW in the previous month. Dedicated cell and module expansions have basically tracked each other through the year. Only in January 2016 did module expansions far exceed cell expansions so far this year.

The most meaningful capacity expansion made in May was that of Taiwan-based PV manufacturer Neo Solar Power (NSP), which announced the closure of an existing 60MW assembly plant in Taiwan but a 500MW to 600MW new expansion in Vietnam.

Vietnam has rapidly emerged to become an alternative destination for module assembly by China and Taiwan-based PV manufacturers with meaningful solar cell production expected to follow in due course.

The fully integrated (200MW to 1GW) planned new build in Iran was announced by the Industrial Development & Renovation Organization of Iran (IDRO) and turnkey equipment supplier, SCHMID Group.

An announcement made at SNEC 2016 led to the second consecutive month of CdTe thin-film expansions (100MW), led by a consortium of China-based firms and Western equipment suppliers. This was the only announcement of capacity expansions in China in May and reflected a c-Si slowdown, compared to 600MW announced in the previous month.




Dedicated PV module capacity expansion announcements reached 1,800MW in May, down from 4,385MW in the previous month.

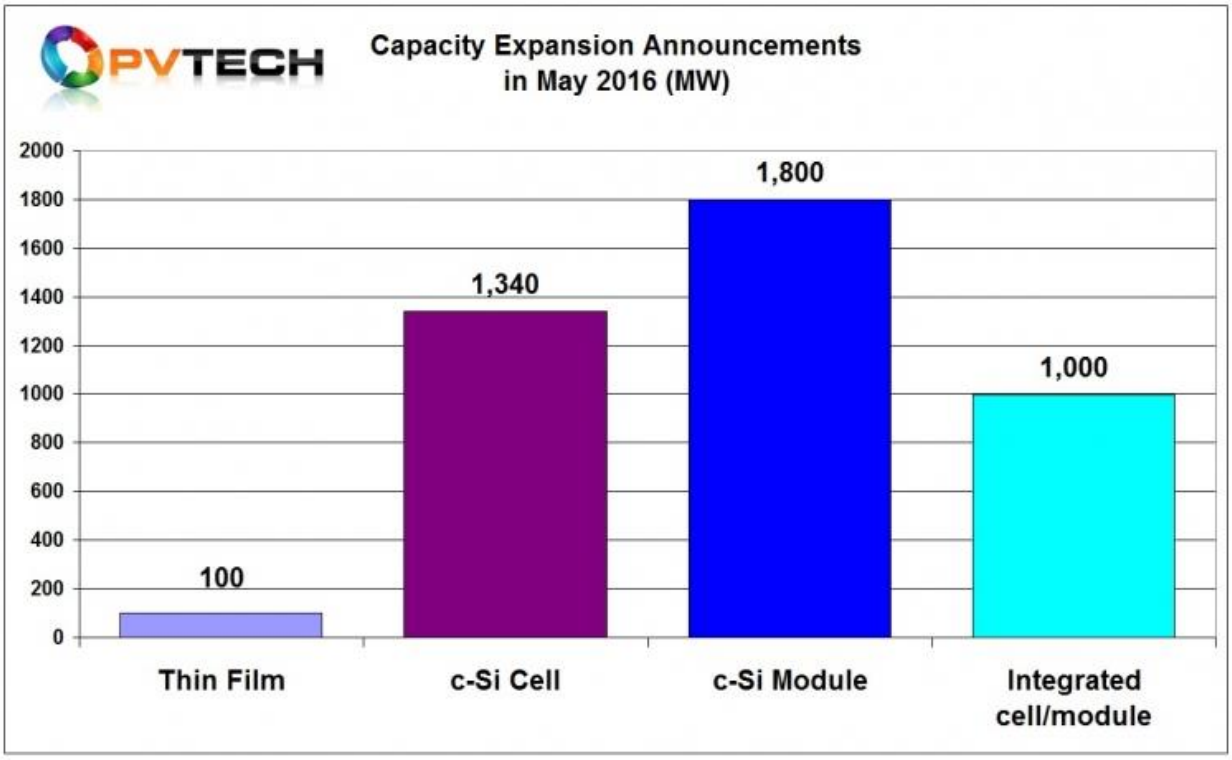
Geographical split

With China only contributing one (100MW) of expansion plans in May, the majority of announcements were centred on South East Asia. Three companies planned expansions in the region totalling almost 1,200MW.

This was followed by India and one company planning an initial 120MW of module capacity nut plans over the next five years to add 500MW of wafer production, 600MW of solar cell and reach 840MW of module assembly by 2021.

However, the MENA region emerged from a long lull in planned expansions and two countries (Morocco and Iran) contributed a total of nearly 1,200MW.

Europe, North America and Latin America were not represented with new expansions planned in May.

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# 五月光伏制造业产能扩张公告显著下降

PV-Tech 的 2016 年五月全球光伏制造业产能扩张公告初步分析，是今年首次显著下降。

五月发布规划的薄膜组件、太阳能电池和组件装配生产，以及完全集成(硅片/电池/组件)新产能的未来扩张刚刚超过 4GW，而上个月规划的未来扩张近 9GW。

这一下降结束了自 2016 年二月以来强劲的连续月度增长，其较 2015 年同期高出约 50%。

五月总计七家公司宣布扩张计划，而四月为十三家。

再一次，谨慎扩展其中国以外足迹的“硅基组件超级联盟”成员及一些中国制造商没有大规模扩张，使整体规划的产能扩张相对于 2016 年前几个月低。

尽管阿特斯阳光电力(Canadian Solar)和海润光伏(Hareon Solar)分别在东南亚和摩洛哥负责小型产能扩张计划，但在中国没有宣布任何硅基产能扩张。

还在五月发布几份推测性公告，其中包括在伊朗和印度的巨大雄心，但是初始阶段扩张很小，也没有执行时间表。剔除这些计划，五月的公告进一步下降约 2GW。

五月专用太阳能电池产能扩张总计 1340MW，而上个月为 3750MW，其中包括 Shinsung Solar Energy 在韩国扩张 160MW 单晶硅产能。

五月专用光伏组件产能扩张公告达 1800MW，较上个月 4,385MW 有所下降。专用电池和组件扩张全年基本上彼此影响。今年迄今仅在 2016 年一月，组件扩张远超过电池扩张。

五月最重大的产能扩张是台湾光伏制造商新日光能源(NSP)，其宣布关闭台湾一家现有 60MW 装配厂，但是在越南新扩张 500MW 至 600MW。

越南已迅速成为中国大陆和台湾光伏制造商组件装配的替代目的地，预计在适当的时候会有大量太阳

能电池生产跟随其后。

伊朗工业发展重建组织(IDRO)和交钥匙设备供应商 SCHMID Group 宣布，规划在伊朗新建完全集成(200MW 至 1GW)。

在 SNEC 2016 作出的公告致使连续第二个月碲化镉薄膜扩张(100MW)，由中国企业和西方设备供应商组成的财团主导。这是中国五月唯一产能扩张公告，反映出晶硅较上个月宣布的 600MW 放缓。

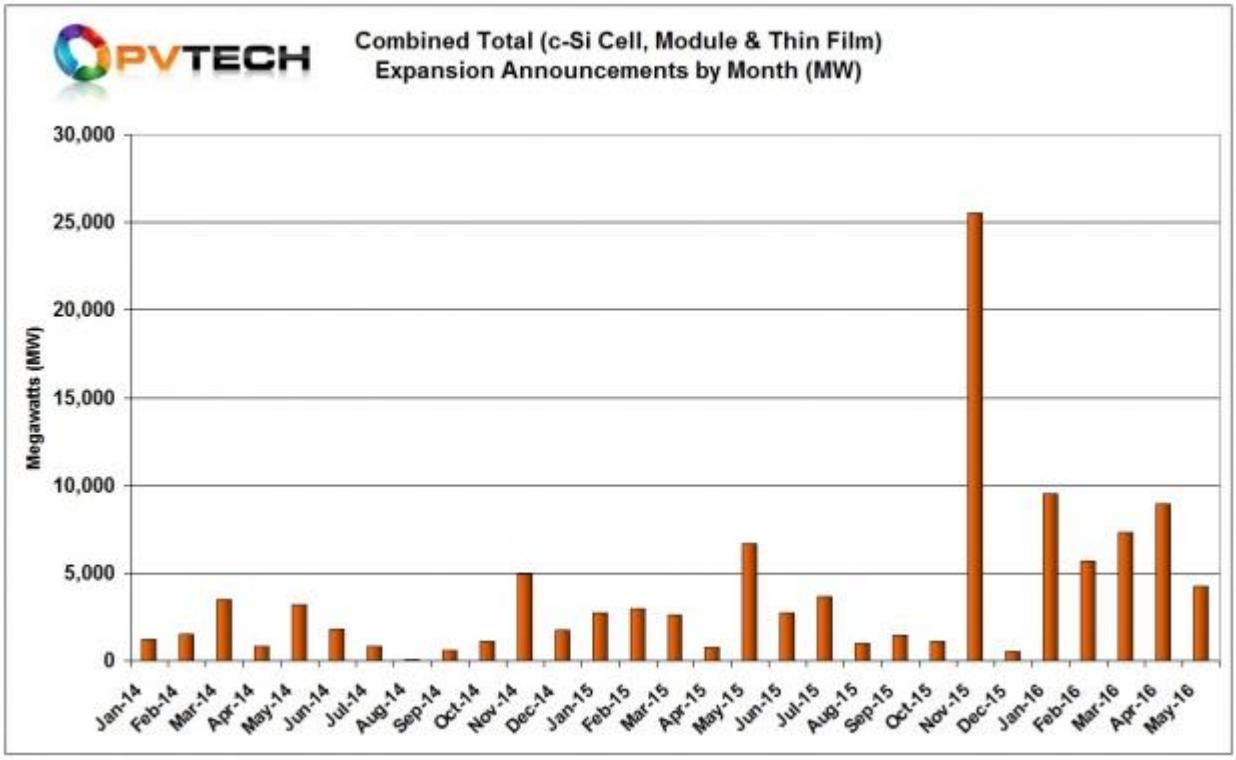
地域划分

鉴于中国五月仅贡献一个(100MW)扩张计划，大部分公告集中于东南亚。该地区三家公司计划扩张，总计近 1200MW。

其次是印度，一家公司规划 120MW 初始组件产能，但计划未来五年增加 500MW 硅片生产，600MW 太阳能电池，到 2021 年组件装配达 840MW。

然而，中东和北非地区摆脱规划扩张的长期停滞，两个国家(摩洛哥和伊朗)贡献总计近 1200MW。

欧洲、北美和拉丁美洲五月没有呈现新规划的扩张。

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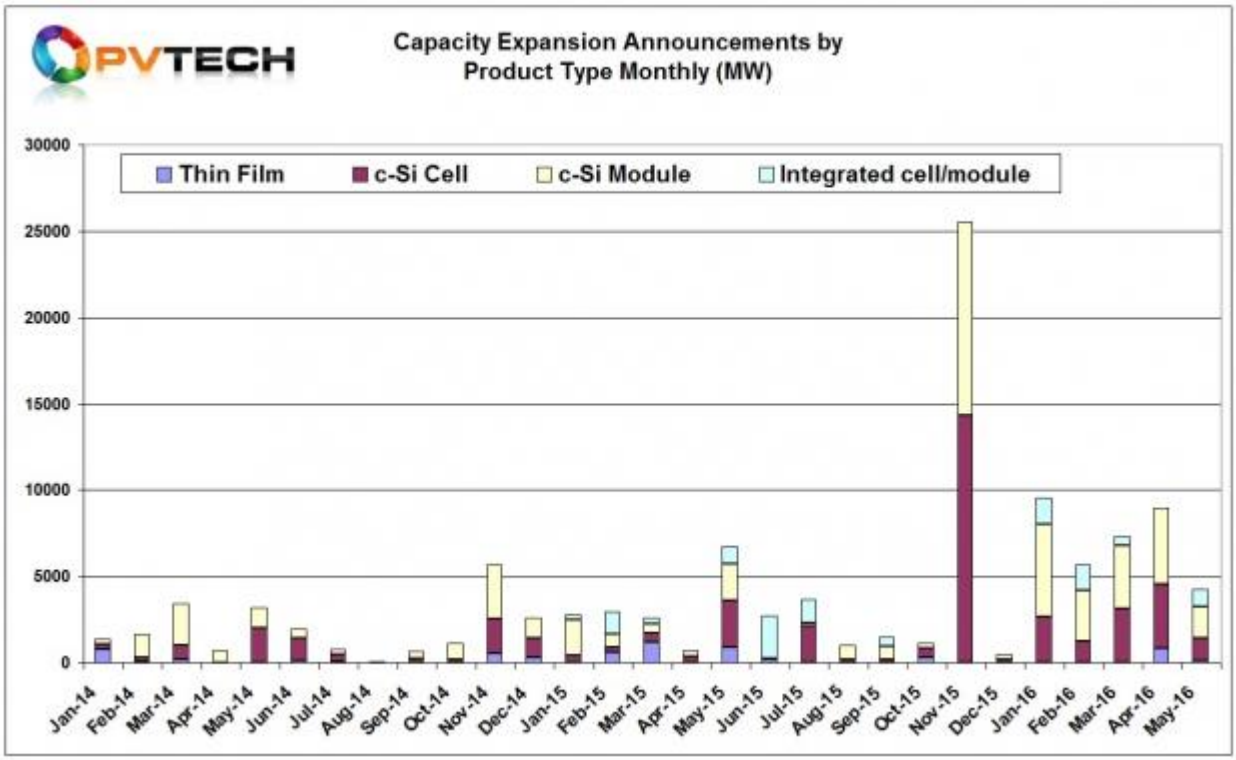
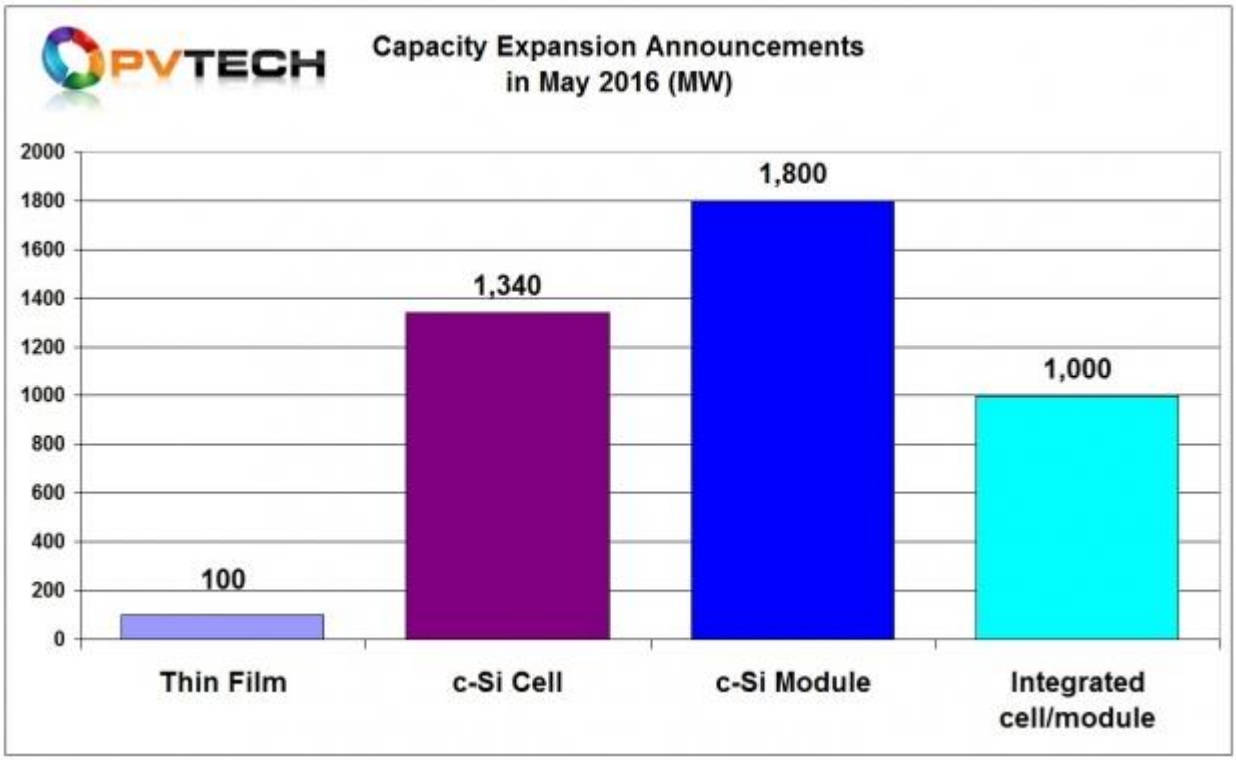



五月专用光伏组件产能扩张公告达 1800MW，较上个月 4,385MW 有所下降




五月最重大的产能扩张是台湾光伏制造商新日光能源，其宣布关闭台湾一家现有 60MW 装配厂，但是在越南新扩张 500MW 至 600MW

# *Natural Gas（天然气）*

## Mexico's Ever Growing Natural Gas Market

Mexico is a very fast growing natural gas market, and imports from the U.S. could reach 8-10% of current U.S. production much faster than most realize. The 2013 Energy Reforms are a historic opportunity for state-owned Pemex to increase oil and gas production and lift the economy. Pemex has been forced to unfairly provided the government with 35-40% of its budget. Too lengthy of a subject to detail here (check here, here, here), but the reforms and the Implementation Plan should install a fully competitive Mexican natural gas market around 2018.

Like the upstream oil and gas sector, Mexico's midstream has been plagued by underinvestment for a very long time. Today, despite having well over four times more people, Mexico has about 1/10 of the pipeline system that Texas has. Much of Mexico's pipeline and generation sectors have been centered in the eastern/northern parts of the country, and the infrastructure buildout is meant to bolster the southern/western areas that have been underdeveloped and isolated.

And with far less costly regulations and environmental opposition, "TransCanada finds warmer welcome in Mexico for pipeline business." Mexico's natural gas midstream sector should expand in length by over 90% in the next three years to 13-15,000 miles of gas pipelines.

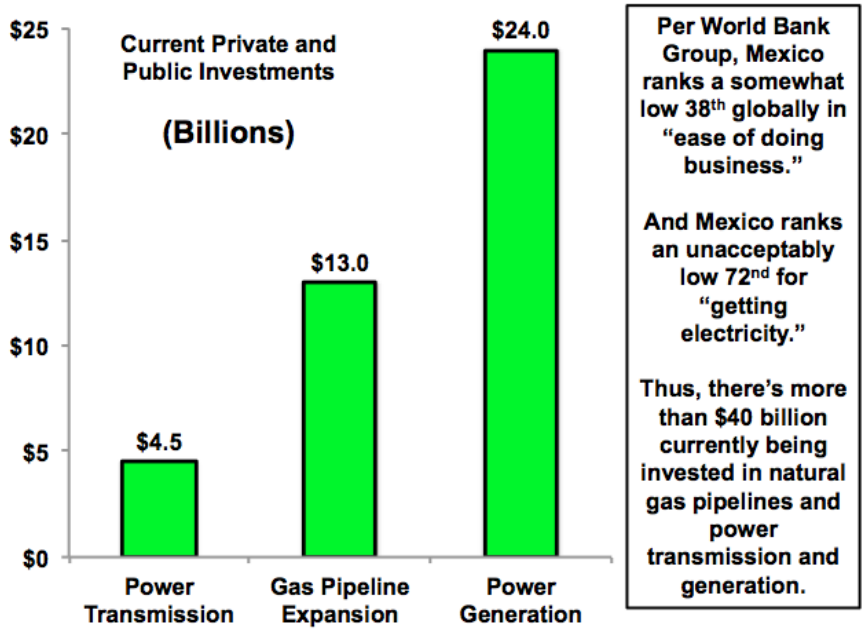
Limitations for both electricity and natural gas have been two key factors constraining output growth in Mexico. The McKinsey Global Institute reports that "despite its energy endowments, Mexico lacks a cost-efficient and reliable power supply, which limits the productivity of even the best-run enterprises." Mexico's transmission and distribution losses have been a crucial weakness and run about 20% of total generation, twice the OECD average.

Poor investment in infrastructure has led gas pipelines to operate near maximum capacity, so even smaller problems can quickly get magnified. Augmented by rising demand, limited gas transport capacity have led to severe gas shortages. Recently in just six months time, "Mexican business leaders say they lost $2.25 billion in revenue."

This simply isn't acceptable for Mexico, now seen as the emerging Latin American giant as Brazil spirals deeper into recession. And there's no excuse for my adopted country: Mexico is a resource rich nation and has access to cheap natural gas from the U.S. at a price that has been about a third of the average price in Western Europe.

These infrastructure shortages have forced Mexico to turn to more expensive LNG from Qatar, Peru, Nigeria, and others. Since 2010, Mexico's gas demand has risen 25% since 2010 to nearly 3 Tcf and could rise another 50% by 2025.

Mexico's High Electricity And Gas Investments




Sources: Baker & McKenzie; JTC

At 20% of GDP, manufacturing is high in Mexico and will headline the boom in natural gas demand. The industrial sector accounts for about 60% of Mexico's electricity sales. Mexico has rising domestic needs, proximity to the U.S., and at a 44 count, more free trade agreements than any other nation. Of note, electricity and natural gas are about 70% of the total energy used in the industry sector and about 90% of the energy used in the automobile industry.

Led by the Maquiladora industry, Mexico's manufacturing sector continues to boom. Most people probably don't know that Mexicans work more hours per year than any people in any other OECD member. Saturday is a typical workday. From 2002-2014, Mexico "doubled the number of two-year colleges and four-year universities available to students. In fact, Mexico now produces more engineers than Germany or Brazil."

As a friendly neighbor, the U.S. shale gas revolution has helped lower gas prices for industrial users in Mexico by 45-50% over the past 10 years, giving the country a major energy cost advantage. "Mexico now has lower direct manufacturing costs than China, and its competitiveness has improved against every major export economy over the past decade" (here).

The world's leading car manufacturers are looking to Mexico. "I can export duty free to North America, South America, Europe and Japan. There's not another country in the world where you can do that," says Thomas Karig, VP, Corporate Affairs for Volkswagen of Mexico (here). From 2005-2015, Mexico more than doubled its car output to 3.6 million units, which is 7th globally and what France and the UK produce combined (here).

"Mexico has now surpassed Japan to become the second biggest car exporter to the U.S., and currently supplies one third of all U.S. imports of auto parts." Bolstered by the recent energy reforms and imports of low cost U.S. gas, "Mexico's falling electricity rates draw manufacturers."

My article (here) explains how Mexico's massive but unplanned and amorphous city growth has given rise to an inherent need for more personal vehicles because public transportation has had no chance to keep up. Cowboy up gringo, and venture beyond the white sands of Cancun and Cabo…to Tijuana…to Guadalajara…to Leon…to Monterrey…to Mexico City.

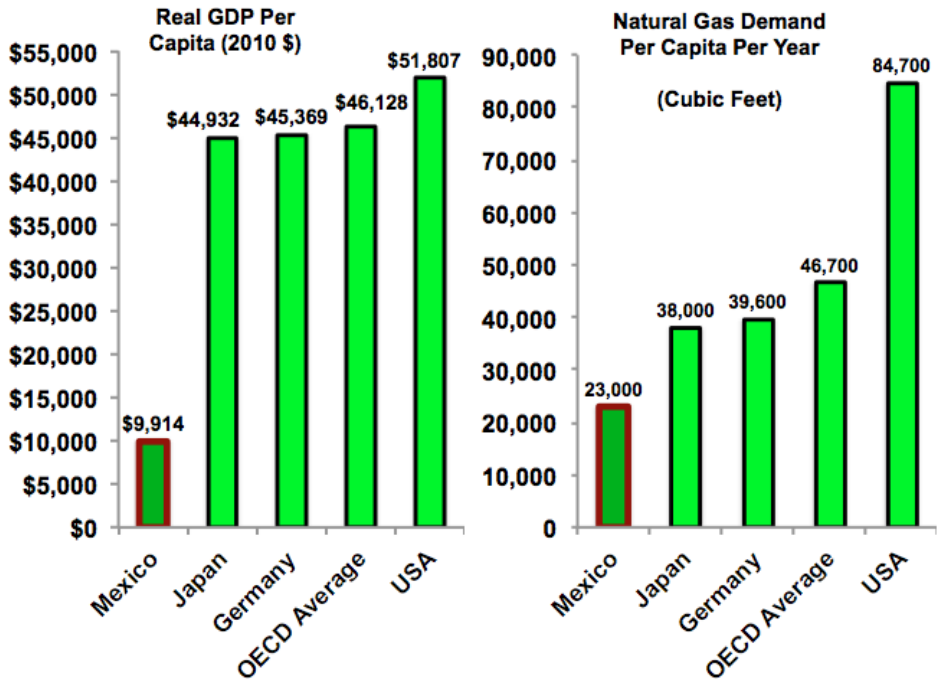
Mexico now has around 350 cars for every 1,000 people, double the rate in 2000 but still far below the 850 mark seen in the U.S. Indeed, given the established connection between more money meaning more vehicles, Mexico's

vehicle fleet will surely rise as the real GDP per capita is set to increase 50% to $15,000 by 2030. Interestingly though, despite 1/5 the personal income, cars in Mexico are priced about the same as in the U.S.

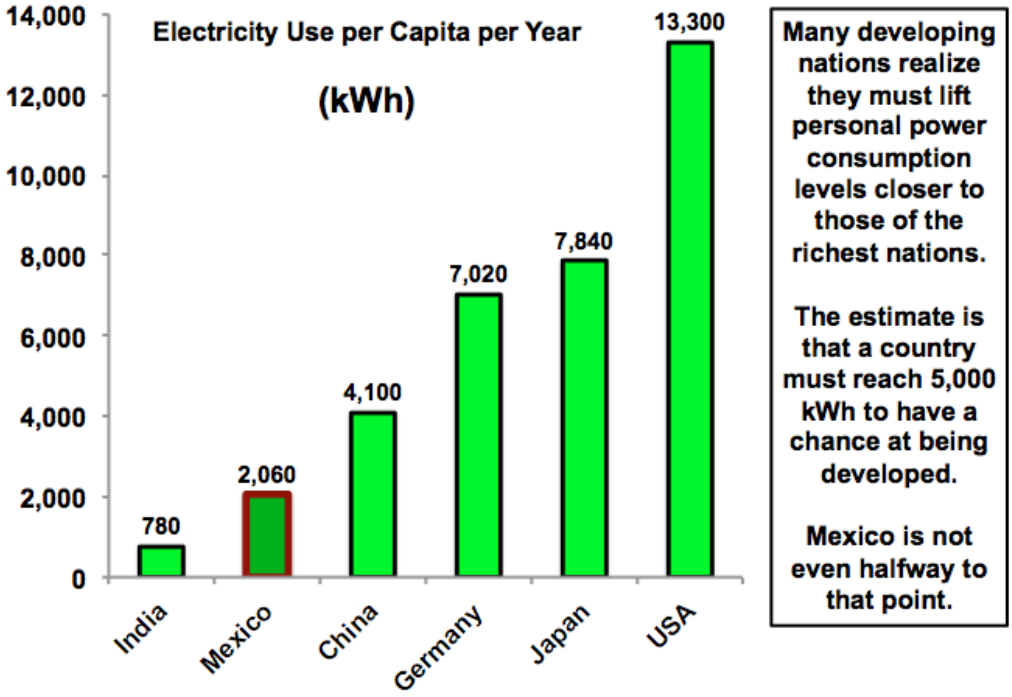
Mexico's manufacturing sector will continue to grow as companies look away from more problematic China that confronts rising labor costs and an economic shift away from export driven growth. Globally, by increasing transportation costs, future rising oil prices will help Mexico's manufacturing sector to become an even bigger hub in the Western Hemisphere.

Yet, the obvious need to increase personal power consumption rates is also at the heart of Mexico's development plan. Mexico easily has the lowest power use rates in the OECD, at just 1/3 of Europe's rate and 1/6 of the U.S. rate. On top of the just announced "Three Amigos Plan," Mexico's personal electricity use will accelerate even faster, now rising by 12-15% every five years. Mexico's middle class has expanded by over 60% since 2009 and is now 50% of the population.

Mexico Has Huge Latent Demand For Natural Gas




Sources: USDA; EIA; JTC




Sources: World Bank; JTC

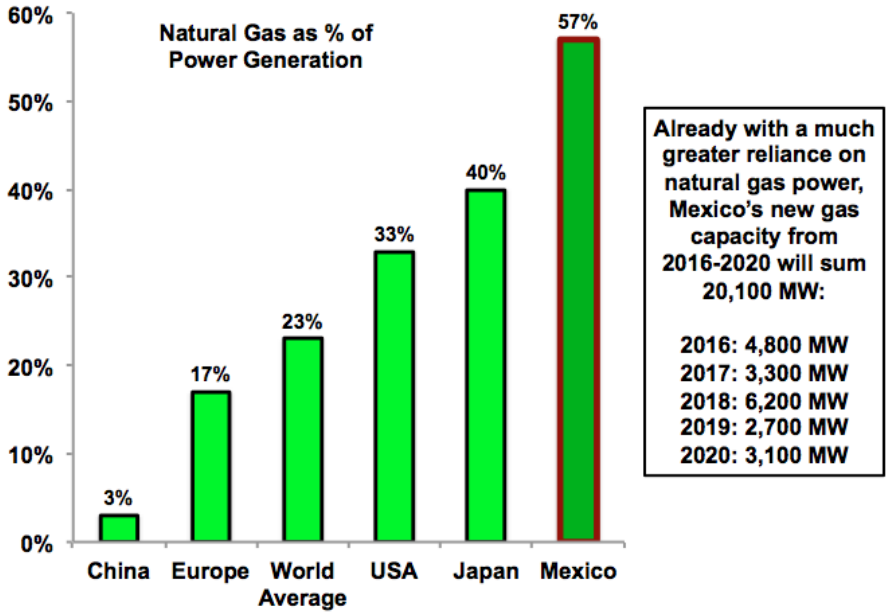
With the peaking of Cantarell, once the 2nd largest oil field in the world, Mexico's oil production peaked about 12 years ago. This has installed natural gas as the "go to fuel," and petroleum's share of total energy demand has been cut from nearly 60% then to 45% today.

Gas now supplies of 40% of Mexico's energy, well above the OECD average of 27%. In the power sector, gas has replaced fuel oil and has lifted its share of electricity from 40% in 2005 to nearly 60%. As I've documented here, this shift to gas has been the main reason why Mexico's oil consumption hasn't spiraled out of control, which would have been a disaster given sunken domestic oil production.

Although it's important to note that fuel oil use is up this year because of sunken prices (here), as Mexico's gasification program marches on, gas will continually displace fuel oil in power generation. There's great room for progress: oil still accounts for about 17-20% of Mexico's power generation, again well above the OECD average of less than 5%.

By 2020, more power generation could account for 2 Bcf/day of new gas demand, most of which will be imported from the U.S. The more than 20,000 MW of new gas capacity in Mexico from 2016-2020 will focus on highly efficient combined cycle power plants. Put this into perspective…that's as much new gas capacity in Mexico over the next four years as California, our largest economy where gas supplies over 60% of power, has installed since 1990.

Mexico's Surging Reliance On Natural Gas




Source: JTC

Since 2000, Mexico's proven gas reserves have been sliced in half to around 15 Tcf, or just 25% of what shale hub Pennsylvania now has. Over the years, nearly 85% of Mexico's hydrocarbon output has been oil. Gas development has been neglected and production has fallen 25% since 2010 to 4 Bcf/day. The reforms will bring much-needed foreign capital and expertise for more hydrocarbon production, but oil will stay the focus particularly since prices are projected to rise.

It makes clear economic sense for Mexico to bind a large portion of its gas future to low cost U.S. shale gas, an ever-growing supply source that lowers Mexico's own gas and electricity prices. Per EIA, U.S. natural gas production is projected to increase nearly 40% to 105 Bcf/day by 2030 alone (here).

But, the main point of the Mexican energy reforms is to increase domestic oil and gas production, and this will eventually happen. Pemex believes that its shale gas and oil resource equals over 60 billion BOE (EIA says its closer to 120 billion BOE), with also about 30 billion BOE of total recoverable hydrocarbons in the challenging deepwater of the Gulf of Mexico.

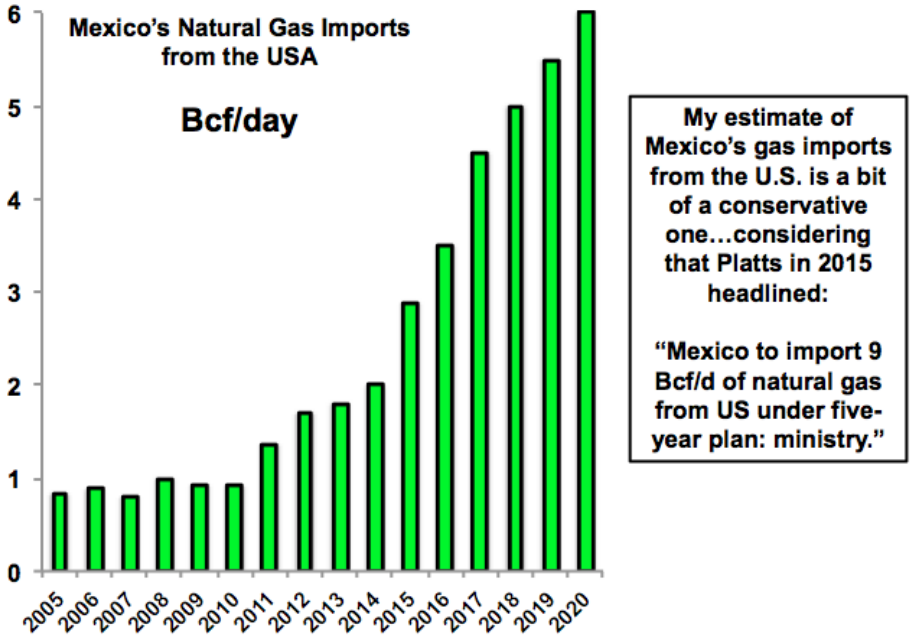
With development perhaps starting in 2020, per Goldman "We estimate these prospective results would require $188 billion in offshore investment and $662-US$1,023 billion in shale investment to fully develop such prospects over a 40-year horizon."

Mexico's shale wells could cost $10-20 million each, which is 2-4 times higher than in the U.S. And water and pipeline shortages will remain a problem. "The pipeline system located near the largest shale formations already operates at 90 percent of capacity." Most of the gas produced in Mexico is associated with oil, but this could shift as shale gets developed post-2020. EIA sees Mexico's gas potential coming to fruition after 2025 (here).

By 2019, pipeline capacity between the U.S. and Mexico should expand to around 15 Bcf/day, more than twice the current level. Fueled by low Henry Hub prices, new pipeline/industrial infrastructure, and the displacement of LNG imports, 2015 was the biggest jump in U.S. exports to Mexico ever, surging 45%. No wonder: at $2.95/Mcf in 2015, the price of exported U.S. natural gas via pipeline was the lowest its been since 1999 and a 45% drop compared to 2014 (here).

First quarter 2016 gas imports into Mexico from the U.S. were 3.4 Bcf/day, or 47% higher y-o-y, and could swell to 4.5 Bcf/day if July scorches. California's "exports to Mexico have increased 45 percent in two weeks." Although more U.S. gas eroded Mexico's LNG imports by around 0.3 Bcf/day in 2015 over 2014, with three

import terminals and one planned, an oversupplied market, and sunken prices, Mexico can still lean on LNG as a fill-in, made easier as new pipelines in the central and coastal regions are built.




Sources: EIA; JTC

## 墨西哥天然气市场持续增长

墨西哥天然气市场增长快速，从美国的进口量占美国总量 8-10%，产量比预期快得多。改革是国有墨西哥石油公司（Pemex）提高油气产量、提升经济的历史性机会。墨西哥石油公司被迫不公平地向政府提供 35-40%的预算。主题太长而不能在这详细介绍（检查这这这），但是改革和实施计划应该在 2018 年左右设置一个完全具有竞争力的墨西哥天然气市场。

像上游油气部门，墨西哥的中油长期受到投资不足的困扰。今天，尽管人口大大超过四倍，墨西哥的输油管系统仅有德克萨斯州的十分之一。墨西哥的许多输油管和发电环节是国家东部/北部的中心，基础设施的扩建有利于支持欠发达隔绝的南部/西部地区。

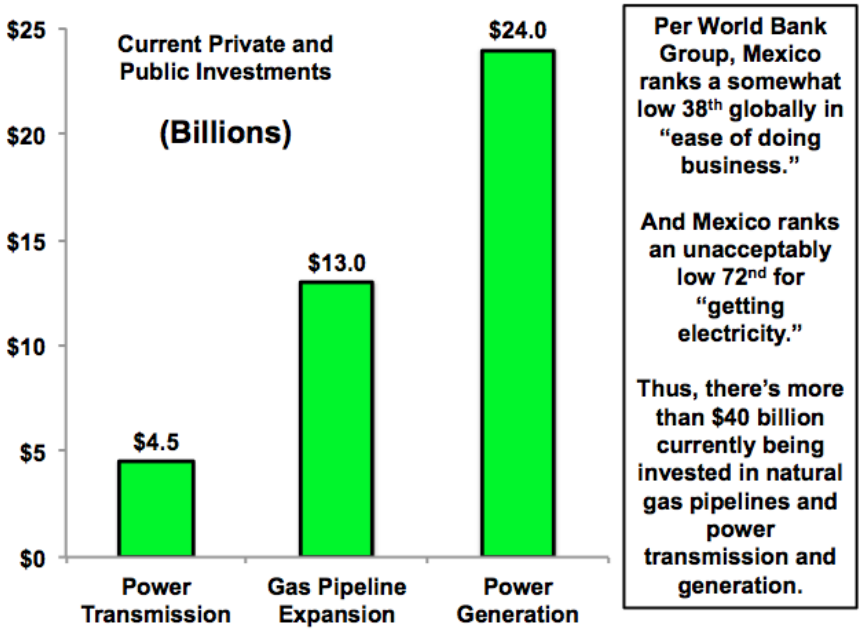
管理代价和环境反对派更少，"泛加输油管在墨西哥输油管贸易中受到欢迎。"墨西哥天然气中游区域应该在未来三年增加 90%长度，输油管在 13-15000 米英里。

电和天然气的限制是限制墨西哥输出量增长的两个主要因素。麦肯锡全球研究所报道说"尽管具有能源优势，墨西哥缺少成本高效、可靠的能量供给，甚至限制了最好的企业生产力。"墨西哥输油传输分配中的损失是重大的劣势，占据总量 20%，是 OECD 平均值的两倍。

基础设施投入少，使得天然气管道在接近最大承载量下运行，所以甚至是小问题也能迅速扩大。需求增加，有限的天然气输送能力导致了严重的天然气短缺。就在最近六个月，"墨西哥企业领导人说他们的收入损失了 22.5 亿美元。"

这仅仅对于墨西哥不合适，现在被看作是和陷入衰退巴西漩涡一样大的新兴拉丁美洲人。我的国家没有任何借口：墨西哥资源丰富，能够得到美国廉价的天然气，价格约西欧平均价格的三分之一。

墨西哥强电和天然气投资




来源：Baker & McKenzie; JTC

制造业在墨西哥 GDP 很高，占 20%，促进天然气需求的旺盛。工业部门占据墨西哥电力销售约 60%。墨西哥国内需求上升，约占美国 40%，有比其他国家更加自由的贸易协定。值得注意的是，电力和天然气占据工业部门使用的总能源的 70%，汽车行业能源的 90%。

受出口加工业影响，墨西哥的制造业持续增长。大多数人可能都不知道，墨西哥人每年工作时长比任何其他 OECD 成员人民都长。星期六就是典型的工作日。从 2002 年到 2014 年，墨西哥"两年制学员和四年制大学的数量翻番。事实上，墨西哥正在比德国和巴西多的工程师。"

作为友好邻国的美国，页岩气革命在过去 10 年中降低了 45-50%的墨西哥工业所用天然气价格，给国家能源带来了成本优势。"墨西哥现在的直接制造成本比中国低。在过去十年中，竞争力较主要出口经济有所提升。"

世界主要汽车制造商正在将目光投向墨西哥。"我可以免关税出口到北美、南美、欧洲和日本。在世界上没有其他国家都不能这么做。"墨西哥大众汽车公司事务部副总裁 Thomas Karig 说道。从 2005-2015 年，墨西哥不仅仅将汽车出口量翻番到 360 万辆，排名全球第 7，是法国英国产量总和。

"墨西哥已经超越日本，成为美国第二大汽车出口商，目前提供美国汽车进口量的三分之一。"最近的能源改革和美国天然气低成本进口价都证明了这一点，"墨西哥低电率吸引了制造商。"

我的文章解释了，墨西哥巨大而又无组织计划的城市增长如何引起更多私人车辆的需求，因为公共交通不可能跟上需求。牛仔外国佬，坎昆和墨西哥白沙的企业向提华纳、瓜达拉哈拉、利昂、蒙特雷、墨西哥城投入。

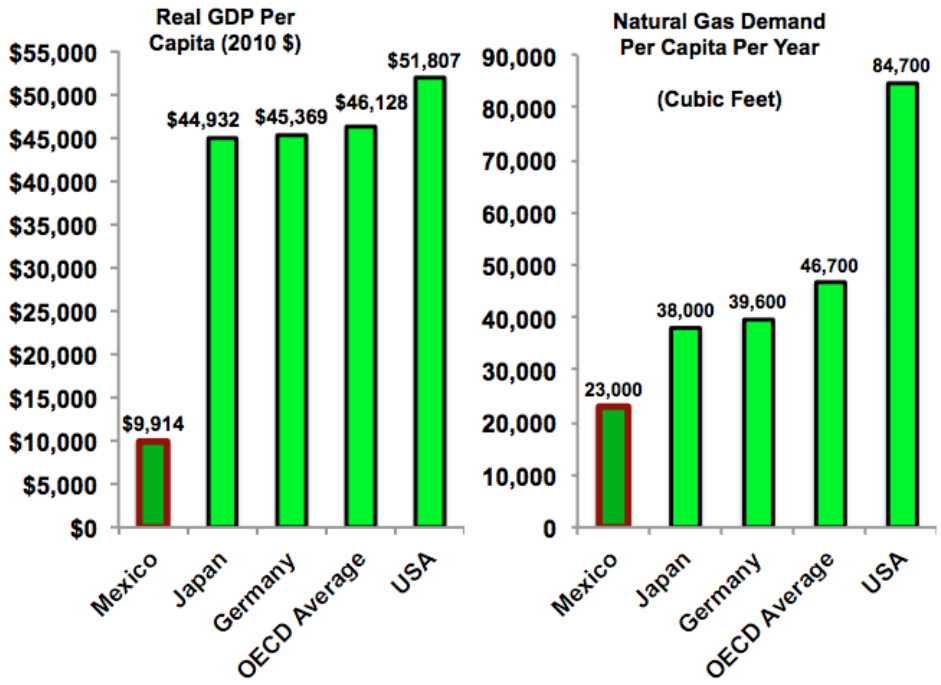
现在，墨西哥每 1000 人大约拥有 350 辆汽车，是 2000 年的两倍，但是与美国每 1000 人有 850 辆相比仍然低得多。的确，考虑到更多钱意味着更多汽车之间的联系，随着 2030 年人均 GDP 增加 50%到 15000 美元，墨西哥的车辆总数一定会增加。有趣的是，尽管占据个人收入五分之一，墨西哥的汽车价格和美国一样。

随着公司将注意力从人力成本上升的中国移开，从出口增长的经济上转移，墨西哥的制造业会继续增长。从全球来说，通过增加交通成本，未来石油价格的上升会有助于墨西哥制造业成为西半球的中心。

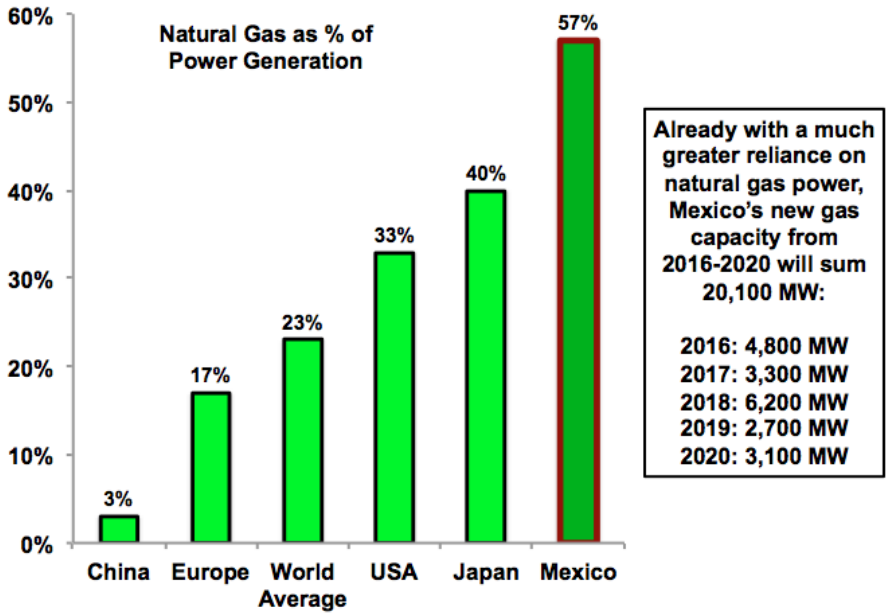
然而，提高个人能源消费的需求也是墨西哥发展计划的中心。墨西哥的能源使用率在 OECD 中最低，只是欧洲的三分之一，美国的六分之一。刚刚宣布的"三个朋友计划"之上，墨西哥的个人电力使用会更

快，现在每五年增加 12-15%。墨西哥的中产阶级自 2009 年来扩大了 60%，目前占人口数 50%。

墨西哥天然气的潜在需求巨大




来源：USDA; EIA; JTC




来源：世界银行; JTC

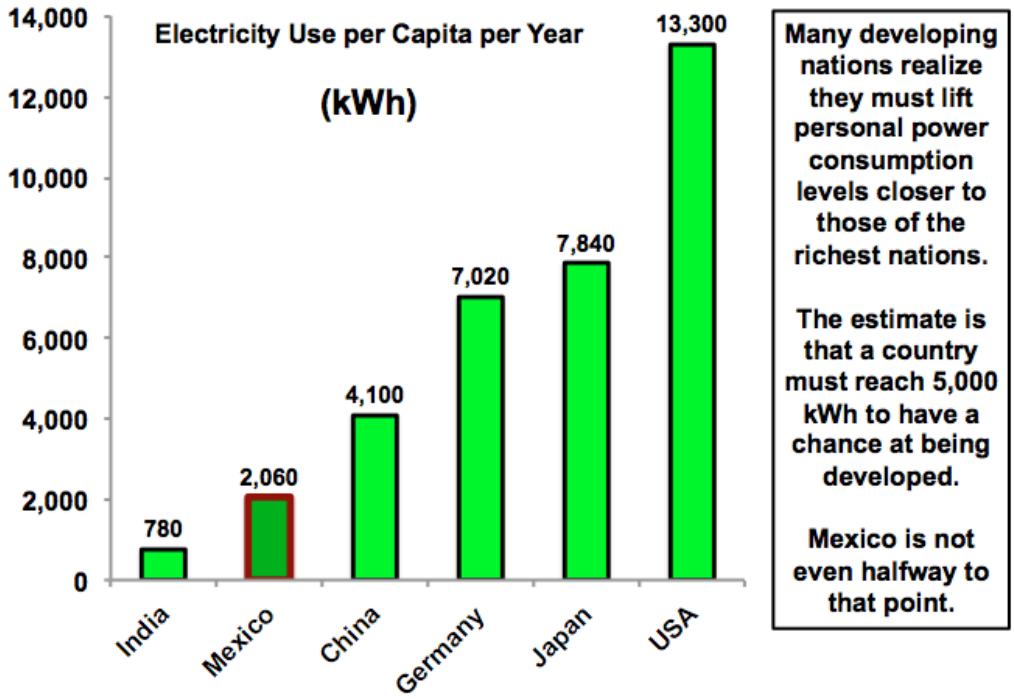
坎塔雷尔油田顶峰期曾是世界第二大油田，墨西哥的石油产量在 12 年前是顶峰期。这使得加天然气成为“加油”的方式，总体能源需求中石油的份额也从近 60%降到如今的 45%。

天然气现在占据了墨西哥 40%的能源，超过 OECD27%的平均值。在电力部门，天然气已经取代燃油，将其 2005 年在电力中的 40%的份额提高到近 60%。正如我这里表明的一样，这种向天然气的转变已经成了墨西哥油耗没有不受控制上升的主要原因，如果国内油产量下降，这就会成为一个灾难。

虽然关注今年燃油因价格下降而使用完了很重要，但是，随着墨西哥气化项目的开展，天然气将继续在发电发面取代燃油。进步空间很大：石油依旧占据发电的 17-20%，再一次高于 OECD 不到 5%的平均值。

到 2020 年，发电会占据新天然气需求的每天 2Bcf，大部分来自美国的进口。2016 年到 2020 年，超过 2000 兆瓦的墨西哥新天然气容量会主要集中在联合循环发电厂。考虑这一点。。。未来四年墨西哥的新天然气量和加州的一样多，自从 1990 年，最大的经济就具备了，其中电力的 60%由天然气提供。

墨西哥非常依赖天然气




来源：JTC

自从 2000 年，墨西哥天然气储量就已经被减少一半，大约 15Tcf，仅是页岩气中心宾夕法尼亚州量的 25%。在那些年，墨西哥碳氢化合物约 85%的输出量都是石油。天然气发展受到了忽视，产量也从 2010 年下降了 25%，每天 4Bcf。改革能为碳氢化合物生产急需的外国资金和专家，但是石油依旧会是重点，因为价格会上升。

墨西哥的经济意识清晰，将大部分的天然气未来与低成本的美国页岩气结合，美国页岩气是不断增长的供应来源，降低了墨西哥本国的天然气和电力价格。据美国电子工业联合会，美国天然气产量预计到 2030 年增加 40%到每天 105Bcf。

但是，墨西哥能源改革的要点是提高国内石油和天然气产量，这最终也会发生。墨西哥石油公司相信，它的页岩气和石油资源超过 600 亿 BOE（美国电子工业联合会说接近 1200 亿 BOE），大约是墨西哥海湾深水中的总计可回收碳氢化合物的 300 亿 BOE。

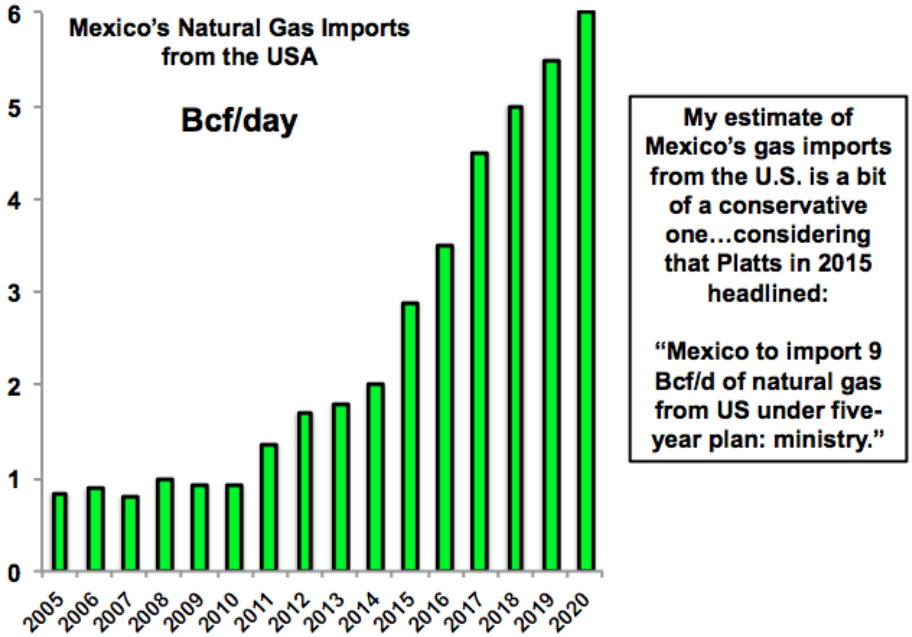
随着 2020 年开始的发展，每个高曼人认为“我们估计这些未来的结果会需要 1880 亿美元的离岸投资以及 6620-10230 亿美元的页岩气投资来利用 40 年充分发展这些潜力。”

墨西哥的页岩气井每个耗费 1000-2000 万美元，比美国 And 水域高 2-4 倍，管道短缺依然是一个问题。“位于最大页岩气的管道系统已经运行了 90%的容量。”墨西哥生产的大部分天然气都与石油有关，但随着页岩气在 2020 后期发展，这一情况会改变。美国电子工业联合会见证了墨西哥天然气潜力在 2025 年后取得成就。

到 2019 年，美国和墨西哥之间的管道容量应该会扩大到每天 15Bcf，超过现有水平的两倍。受亨利中心低廉的价格，新管道/工业基础设施和液化天然气进口的替换的影响，2015 年是美国出口墨西哥最大的

进步，激增了 45%。毫无疑问：2015 年管道出口美国的天然气价格自 1999 年来最低，与 2014 年相比降低了 45%，每 Mcf2.95 美元。

2016 年第一季度从美国进口到墨西哥的天然气为每天 3.4Bcf，与去年同期相比高出 47%，如果七月火爆，能够暴增至每天 4.5Bcf。加州“对墨西哥的出口已经在两周内增加了 45%。”虽然美国天然气不利于墨西哥液化天然气进口，与 2014 年相比，2015 年降低了的数值约为每天 0.3Bcf。拥有三个进口途径，一个有计划、供应过剩的市场和低廉的价格，墨西哥仍然可以依赖液化天然气作为补充物。随着中心和沿海地区新管道的建设，这也更加容易。




来源：EIA; JTC

# Gazprom's New Strategy Of Control: Recapturing EU Gas Market

Britain's exit from the European Union is a huge blow to European project with potentially devastating implications for its' latest flagship policy – Energy Union. The United Kingdom has been one of the strongest proponents of EU energy market integration, liberalization, and diversification. By using the power of consorted action, Energy Union was intended to confront gas monopolies, such as Gazprom, in the fight against price discrimination and market distortions. As fallout from Brexit rattles Brussels, Kremlin-backed Gazprom is well positioned to seize the moment to recapture this lucrative market for Russian gas. This article takes a closer look at recent developments in European Union energy policy and examines opportunities for Gazprom to gain a stronger influence over downstream energy relations in the continent.

The State of the Energy Union was created by the European Commission in February 2015 on the following promises: diversification through embracing LNG exports from alternative suppliers, market integration by building gas interconnections among EU member states, and ownership unbundling of critical gas infrastructure. Despite member states' pledge for unconditional support of this policy, public support for the Energy Union has been dismal. The controversial Nord Stream- 2 pipeline along with Gazprom's recent acquisition of strategic gas storage facilities within the EU have raised eyebrows across Europe's capitals. Delays in building critical gas transmission lines between northern and southern Europe further eroded public confidence in European Energy Union.

Yet, there have been some positive developments for this policy as a result of increasing competition and liberalization of the EU gas market. Eastern and central Europeans zealously embraced growing LNG exports from Qatar, Australia, and the United States. Preference for LNG over piped gas in Lithuania and Poland has already cost Gazprom billions in lost revenues from re-negotiating purchasing contracts. After commissioning "Freedom" LNG Terminal in Klaipeda, Lithuanian utilities were able to reduce the purchase price of Russian gas by 23%, from about 32.9 Euro per megawatt/ hr to 25 Euro per megawatt/ hr. Poland, which relies on Russian gas for 2/3 of its imports, recently announced that it would not renew its contract with Gazprom after it expires in 2022. Gazprom issued a press-conference immediately after the announcement to remind stakeholders that both Gazprom and Poland have 'always found compromises' since Poland began importing gas from Russia in 1948.

While LNG exports to Europe clearly strengthened the bargaining position of European governments vis-a-vis Moscow, they have not freed the continent from Russian gas. There are several reasons why this has not yet happened. There are strong headwinds against LNG in Europe, which include low energy prices and sluggish demand in the EU. Gazprom Chief Executive Officer recently took a swipe at American LNG saying that it will not a "panacea" for Europe, and suggested the company is ready to embrace the competition. Indeed, gas prices across Europe have fallen 37%, which does not favor a satisfactory return on investments in large scale LNG terminals. Many hope that LNG spot market could be competitive with piped gas in the long run as technology and economies of scale move forward. However, those EU countries that opted for LNG exports already today seem to prioritize geopolitical risk and security of supply over short term economic benefit. Regardless of the rational for LNG imports to Europe, member states have opted to set their own policy agenda instead of forming a unified front across Europe.

The lack of unified agenda has proved to be Europe's "Achilles Heel" that Gazprom has been successfully exploiting. In 2015 Gazprom supplied record volumes of gas to Europe- 158.56 bcm, which is 8% increase from 146.6 bcd in 2014. The bulk of these deliveries were to western Europe and eastern Europe took only 18%. Despite geopolitical tensions between Moscow and Brussels, Gazprom has been successfully implementing the strategy of "divide and conquer" with some powerful support within the European Union. Nord Stream-2 pipeline, a joint German-Russian project became the building block of that strategy, which runs contrary to the agenda of Energy Union. Stream-2 (annual capacity of 55 bcm) will deliver gas to Germany and western Europe, bypassing transit routes in Ukraine, Poland and Czech Republic, stripping them of transit payments. Nord Stream-2 by design is a twin pipeline of already operational Nord Stream that is fed into the German grid connected to at least five transition pipelines (JAGAL, MIDAL, STEGAL in the east, WEDAL and Hamburg-Rehden in the west, all of which are controlled by Gazprom-Wintershall joint company Gascade Gastransport). However, current gas demand in Germany is rapidly declining due to competition from subsidized renewables and cheap coal. This energy equation makes additional gas volumes delivered by Nord Stream- 2 obsolete in Germany's electricity generation and heating. What makes more sense for Germany is to transfer these gas molecules further west- to France and the Netherlands. Dynamic western Europe energy markets are also highly sought after destination for LNG producers. To prove the point of real destination for Nord Stream 2 gas, one simply needs to examine the planned gas infrastructure projects that will be constructed simultaneously with the Stream. In contrast with long awaited North-South corridor interconnections, these lines had no difficulty in quickly finding agreeable investors. Stream-2 annual capacity perfectly matches combined capacity of 55 bcm of OPAL and NEL – new transit lines in German territory, which makes Gazprom an exclusive provider of gas to both lines. OPAL is slated to feed some volumes (via Gazelle) into the MEGAL pipeline (44-percent French interest), which runs from Bavaria into France. NEL (with 39-percent Dutch and Belgian interests) is planned to reach from northwestern Germany into the gas markets of the Netherlands and Belgium and potentially farther afield. By design OPAL and NEL could be fed only with Russian gas, transforming them and Germany into a new transit choke point of Russian gas in Europe.

Another building block of Gazprom strategy in Europe is the acquisition of strategically located gas storage units along OPAL and NEPAL route. In fact, these storage sites controlled by Gazprom in Germany are planned to operate in congruence with Gazprom-controlled transmission pipelines. Consequently, throughout the value chain of Nord Stream-2 there is only one dominant player – Gazprom – and risks to the 'security of supply' are not diversified among various actors but instead reside entirely with the Russian gas giant. According to the European

Union's Third Legislative Package gas, producers and suppliers cannot control the transport and storage infrastructure simultaneously. Yet, in the German case someone willingly turned the blind eye to Gazprom's breach of the EU law.

There is no surprise that eastern European nations that lack access to gas supply from the Western Europe fiercely oppose this pipeline. In March 2016 leaders of Latvia, Lithuania, Poland, Czech Republic, Slovakia, Romania, Estonia and Hungary signed a letter of objection to European Commission. Their position was supported by western European governments that are not benefiting from the Nord Stream pipeline, which included Italy and United Kingdom. The addition of the UK to the anti-Nord Stream 2 camp in Europe transformed it into truly meaningful opposition that had to be reckoned with. It was expected that considerable pressure from a united western-eastern opposition to the pipeline would force Gazprom to make further concessions to eastern European countries in terms of price and contract terms. However, with Britain out of the European equation it becomes less clear how much influence the eastern European bloc can have on its own. The same logic applies to Gazprom strategy in Ukraine. The company announced that it would stop all gas supplies though Ukraine by 2019. It was expected that Russia might suggest that it would maintain supplies to Ukraine as long as there is an acceptable payment agreement; it could even be by a third party. Without coordinated action from EU member states on this issue it would be hard to find that responsible third party.

Consequent to Nord Stream 2 and tight partnership with German utilities, Gazprom is expected to increase its gas export capacity to Europe. By flooding Europe with gas, it will further depress gas prices on the continent. If Russia chooses to do so, it can easily price out LNG competition in short to medium term. By implementing the strategy of rapid export increases and picking out "partners in crime" Gazprom sends a clear message that it is in control of the European gas market. But it doesn't have to be that way. Despite the shock waves Brexit has sent though the European Union it is essential for the remaining member states to maintain ambition and momentum of the Energy Union. Nord Stream -2 is a major step back for that policy but just because one builds a line, it doesn't mean that it will be utilized. This will be a European choice that will not be controlled by any gas monopoly.

## 俄罗斯天然气公司控制新策略：重获欧盟天然气市场

英国退出欧盟对欧洲项目来说，就是一个巨大的打击，可能会破坏最新的旗舰政策—能源联盟。英国是欧盟能源市场一体化、自由化和多样化最强大倡议者之一。通过伙伴行动力量，欧盟打算面对像俄罗斯天然气工业股份公司一类的天然气垄断组织，与其进行价格歧视和市场扭曲斗争。英国退欧的结果使布鲁塞尔惊慌，克里姆林宫支撑的俄罗斯天然气工业股份公司定位于为俄罗斯天然气抓住这一重夺诱人市场的机会。这篇文章着眼于欧盟能源政策的近期发展以及分析俄罗斯天然气工业股份公司在大陆下游能源关系中获得更大的影响的机会。

欧盟委员会于 2015 年 2 月创办的能源联盟基于以下承诺：从不同供应商处进口液化天然气，促进多样化；建立欧盟成员国天然气连接，促进市场一体化以及拥有临界气体基础设施。尽管成员国保证无条件支持这一政策，能源联盟的公共支持情况不好。具有争议的北溪-2 管道以及俄罗斯天然气工业股份公司近期收购欧盟战略性天然气储存设施吸引了欧洲资本的注意。北欧和南欧之间的临界气体传输管道的延期建设进一步损伤了欧洲能源联盟的公众信心。

然而，增加欧盟天然气市场的竞争和自由化促进了这一政策积极发展。东欧和中欧积极拥抱增长的卡塔尔、澳大利亚和美国出口的液化天然气。立陶宛和波兰管道气体液化天然气的偏好耗费了俄罗斯天然气工业股份公司数十亿美元，损失在重商购买合同上。克莱佩达港的"自由"液化天然气终端运行后，立陶宛的公用设备能够降低 23%的俄罗斯天然气购买价，从每千瓦/小时 32.9 欧元降低到每千瓦/小时 23 欧元。波兰，进口量的 2/3 依靠俄罗斯进口，最近宣布在 2022 年与俄罗斯天然气工业股份公司到期后不会再续约。俄罗斯天然气工业股份公司在该宣布后立马举行新闻发布会，提醒股东俄罗斯天然气工业股份公司和波兰在 1948 年波兰开始从俄罗斯进口天然气后"一直在寻找和解"。

出口欧洲的液化天然气明显加强了欧洲政府与莫斯科的谈判地位，但是并没有将大陆从俄罗斯天然气

中解放。这一情况没有发生有几个原因。欧洲液化天然气逆风强，包括能源低价以及欧盟低要求。俄罗斯天然气工业股份公司总裁最近挥臂重击了美国液化天然气，说这不会是欧洲的“神丹妙药”，建议公司准备好迎接竞争。的确，欧洲天然气价格已经降低 37%，对大规模液化天然气终端投资不会有令人满意的回报。许多人希望，随着技术和规模经济前进，液化天然气现货市场会是管道天然气的长期竞争。然而，这些倾向于液化天然气出口的欧盟国家今天已经似乎分清地缘政治风险以及短期经济利益的供应安全。不考虑欧洲进口液化天然气的合理性，成员国选择设置自己的政策议程，而不是形成欧洲的统一战线。

缺少统一日程已证实是欧洲的“致命要害”，而这也是俄罗斯天然气工业股份公司一直成功探索的。2015 年，俄罗斯天然气工业股份公司供应欧洲的天然气记录量为 158.56bcm，较 2014 年的 146.6bed 增加了 8%。大部分的货是运往西欧，东欧只占 18%。尽管莫斯科和布鲁塞尔的地缘政治紧张，俄罗斯天然气工业股份公司在欧盟国家的强大支持下，已经成功实施“划分和征服”战略。北溪-2 管道，一个德国-俄罗斯联合项目成为那一战略的重要构成，与欧盟议程相反。北溪-2（年容量 55bcm）将会输送天然气到德国和西欧，绕开乌克兰、波兰和捷克共和国的输送道路，去除输送费用。设计的北溪-2 是与一支已经运行的北溪一样，该管道进入德国，连接至少 5 条运输管道（JAGAL, MIDAL, 东部的 STEGAL, 西部的 WEDAL 和 Hamburg-Rehden, 这些都由 Gazprom 和 Wintershall 联合公司 Gascade Gastransport 控制）。然而，由于补助可再生能源和低价煤炭的竞争，德国现在的天然气需求快速下降。这一能量方程使得北溪-2 输送的额外天然气量在德国发电加热中过时。对德国更有意义的是，将这些天然气分子往西输送到法国和荷兰。动态西欧能源市场也是液化天然气生产商追逐的目的地。为了证明北溪-2 的真实目的地，只需要检查计划的，与北溪同时建设的天然气基础设施项目。相反，有了长期等待的南北走廊连接，这些管道找到合适的投资者并不困难。北溪-2 的年容量完美匹配 OPAL 和 NEL55bem 的容量—德国领土内的新输送线路，俄罗斯天然气工业股份公司成为唯一投资两条线路的投资者。OPAL 被责骂将一些量（通过 Gazelle）送到 MEGAL 管道（法国股权 44%），从巴伐利亚州进入法国。NEL（荷兰比利时股权 39%）计划于德国西南部进入荷兰比利时天然气市场以及其他区域。OPAL 和 NEL 只能输送俄罗斯天然气，将他们和德国变为俄罗斯天然气进入欧洲的的一个输送阻碍点。

欧洲的俄罗斯天然气工业股份公司战略的另一个构成，就是收购 OPAL 和 NEPAL 沿线的战略性定位天然气储存单位。事实上，这些俄罗斯天然气工业股份公司控制的德国储存地点计划与 Gazprom 控制运输管道同时运行。结果，北溪-2 的价值链上只有一个主要玩家—Gazprom—“供应安全”的风险在演员中没有多样化，但是相反完全和俄罗斯天然气巨头居住。根据欧盟第三个立法方案，生产商和供应商没能同时控制交通和储存基础设施。然而，在德国，有人愿意将蒙蔽的双眼转向违背欧盟法的 Gazprom。

毫不惊讶的是，缺少西欧天然气供应的东欧国家强烈反对这条管道。2016 年 3 月，拉脱维亚、立陶宛、捷克共和国、斯洛伐克、罗马尼亚、爱沙尼亚和匈牙利的领导人签署了反对欧盟委员会的信件。他们得到没有从北溪管道中获益的西欧政府支持，包括意大利和英国。英国加入欧洲反北溪 2 号营将其变为一场不得不认真考虑的、真正有意义的反对。来自联合东西反对方的巨大压力会迫使 Gazprom 在价格和合同条款方面向东欧国家进一步退让。然而，英国脱欧使其变得不明朗，东欧本身还有多少影响力。同样的逻辑应用于乌克兰 Gazprom 战略。该公司宣布，2019 年将停止所有乌克兰的天然气供应。俄罗斯有望保持向乌克兰的供应只要能接收付款协议；甚至可能由第三方完成。没有欧盟成员国就这一议题的联合行动，找到负责的第三方就会困难。

有了北溪 2 号的结果以及与德国公共设施的紧密合作，Gazprom 有望增加对欧天然气出口量。天然气侵入欧洲，会进一步降低天然气价格。如果俄罗斯选择这么做，就很容易在中短期将高价无销路的液化天然气打败。使用快速出口战略增加以及挑选“同心伙伴”，Gazprom 清楚发出信号，它受到欧洲天然气市场控制。但未必是那样。尽管英国脱欧的冲击波已经发出，但是对剩下国家来说保持欧盟雄心和动力很有必要。北溪-2 是支持那一政策的关键一步，但仅因为建立了一条线路，并不意味着就要使用。这是欧洲的选择，不受任何天然气垄断的控制。

# Japan racing to create LNG benchmark for Asia

Japan is firing up efforts to develop a price benchmark and LNG trading hub for Asia, seeking to beat rivals such as Singapore to the punch.

"We welcome the rising momentum for creation of an LNG index in Asia," said Hiroki Sato, vice president in the fuel procurement department at JERA. The joint venture between Tepco Fuel & Power and Chubu Electric Power became a trade participant last month at the Japan OTC Exchange, an over-the-counter LNG platform set up by the Tokyo Commodity Exchange and a partner.

JERA, the world No.1 in terms of LNG procurement, is looking to reduce contracts linked to crude oil prices and increase spot purchases. Now that the supply-demand balance for LNG is loosening this year, LNG's correlation to oil is weakening, meaning opportunities to buy LNG at low prices are growing. But for that to become reality, highly transparent prices that can serve as a benchmark will be necessary.

Long way to go

The significant glitch to this scenario is that just one contract, involving roughly 5,000 tons, has been traded since the Japan OTC Exchange began handling LNG in September 2014. The Tokyo Commodity Exchange wants to leverage JERA's participation to jump-start the bourse. Toward this end, it aims to add a physical delivery option -- trades can only be settled in cash at present.

The Japan OTC Exchange got a boost in March when the Chicago-based CME Group began providing clearing services, a development made possible after Japanese Prime Minister Shinzo Abe lobbied Leo Melamed, CME chairman emeritus. Having the CME Group as a service provider lessens credit risk.

The Japan OTC Exchange currently has 26 trade participants. "We want to encourage traders in Singapore [who would be sellers] to join," said Takamichi Hamada, president and CEO of the Tokyo Commodity Exchange.

Rivals abound

Japan's main rival is Singapore, where the government is spearheading efforts to establish a trading hub by building LNG receiving terminals. Singapore Exchange listed futures and swaps in January. It has 22 companies cooperating in benchmark price calculation, and has recorded trades equal to 500 tons of LNG so far.

China is another competitor, showing an initiative to create an exchange in Shanghai.

The Intercontinental Exchange of the U.S. has recorded a surge in clearing transactions of swap trades for Asian prices published by energy research company S&P Global Platts. Trades by European players hit a record 260,000 tons or so in April. "Platts is one step ahead of us in terms of creating a benchmark," a Japanese government official said.

LNG exports from the U.S. with no set destinations will start next year, a development expected to increase spot transactions. "If a market with high liquidity is created, that is sure to create an exodus of traders," said a source at a Japanese exchange.

Asia accounts for 70% of global LNG demand.

# 日本力争为亚洲创建 LNG 基准

日本将开始努力为亚洲开发出一个价格基准以及 LNG 贸易枢纽，想要为新加坡这样的对手猛烈一击。

“我们希望亚洲 LNG 指数的创建出现回升势头，”JERA 燃料采购部门的副总裁佐藤弘树表示。这个由东京燃料动力公司和中部电力公司共同成立的合资企业在上个月成为了日本 OTC 交易所的一个贸易参与者，该交易所是由东京工业品交易所及其合伙们成立的一个直接交易 LNG 的平台。

在 LNG 采购方面排名世界首位的 JERA 希望减少与原油价格相关的合约，并且增加现货采购。现在，LNG 的供需平衡在今年出现了松动，LNG 与石油的相关性正在减弱，这意味着以低价购买 LNG 的机会在增加。但是要将此成为现实，可能作为一个基准的高度透明的价格是必要的。

很长的路要走

这种情况的重要差错仅仅在于一个合约，涉及了大约 5000 吨，自 2014 年 9 月日本 OTC 交易所开始处理 LNG 开始就已经成交的合约。东京工业品交易所希望利用 JERA 的参与来启动该交易所。朝着这个目标，它的目的是增加一个实物供应选项——目前只能够通过现金结算的交易。

日本 OTC 交易所在三月受到了提振，当时芝加哥的 CME 集团开始提供结算服务，这一发展是由于日本首相安倍晋三游说了 CME 的名誉主席利奥•梅拉梅德之后才使之成为可能的。拥有 CME 集团作为服务供应商削减了信贷风险。

日本 OTC 交易所目前拥有 26 家贸易参与者。“我们希望鼓励新加坡的贸易商的加盟（有可能成为卖家），”东京商品交易所的 CEO 兼总裁滨田隆道表示。

竞争对手比比皆是

日本的主要竞争对手是新加坡，该国政府正积极致力于通过建设 LNG 接收终端来建立一个贸易中心。新加坡交易所在一月上市了期货和掉期。其拥有 22 家企业参与基准价格的计算，并且到目前为止已经报告了相当于 500 吨 LNG 的交易。

中国是另一个竞争对手，表现出在上海建立一家交易所的主动性。

美国的洲际交易所已经记录了在清理掉期贸易交易方面能源研究企业 S&P 全球普氏能源资讯公布的亚洲价格的激增。欧洲参与者的交易在四月达到了创纪录的 26 万吨左右。“普氏能源资讯是我们创建一个基准方面的障碍，”一名日本政府官员表示。

美国 LNG 没有目的地的出口量将于明年开始，这一发展预计会增加现货交易。“如果创建了一个具有高流动性的市场，那么肯定就能够创造一个贸易商的外流，”日本交易所的一位消息人士表示。

亚洲在全球 LNG 需求中占到了 70%。

# *Minerals（矿产）*

## From debtor to winning bidder: a Chinese SOE turns around

When Wei Zhang, founder of Yuanhao Capital, a Shanghai based investment firm, visited Shanghai Pujiang Cable a few years back, the state-owned enterprise was in dismal shape, unable to pay back its bankers the money it had borrowed from them.

But Mr Zhang’s driver was impressed. “I asked him why he thought this company was so impressive,” Mr Zhang recalls, surprised the man had a view at all. “He told me, did you see the parking lot where the management park their cars? There are at least 20 luxury cars there!”

Where the driver saw prosperity, his employer saw a symptom of the general dysfunctionality of most of China’s state-owned enterprises. At the time, the top tier of Shanghai Pujiang’s staff earned only about Rmb3,000 ($450) a month. It was predictable then that virtually every major supplier to the manufacturing company was headed by a relative of senior management; almost everyone in a position to engage in related party dealings did so and padded their expenses generously. Nobody gave a thought to the fact that customers often did not pay their bills for years, let alone made an attempt to collect the money owed.

“Everyone cheated, many receipts are fake,” Mr Zhang remembers. “You can even find diaper receipts among business expense claims. Everyone was ripping off the company.”

Today, the seemingly intractable lack of profitability of the state-owned enterprises, particularly in heavy industries such as steel, is giving rise to widespread despair.

Steel is among those sectors that generate returns below their cost of capital, according to a study on Chinese productivity from McKinsey Global Institute. Chinese “steel production has become completely untethered from real market demand and is now more than double the combined production of the four next leading producers”, says a recent report from the European Union Chamber of Commerce in China, giving a sense of the magnitude of the problem. Europe’s steel industry, including ArcelorMittal, the world’s largest steel company, has been among those suffering from the excess capacity of mainland steel firms.

Even the news that two of China’s largest and most modern steel producers — Baosteel Group and Wuhan Iron & Steel — may merge in an effort to rationalise production has not dispelled investor gloom.

Mr Zhang, however, is not among the hand-wringers. His experience after buying Shanghai Pujiang is instructive. By raising salaries and changing the incentive structure, he gave his managers much less motivation to rip off the company. “Everyone steals,” he says. “They needed to understand that they are stealing from themselves.”

Mr Zhang had much to work with as he sought to turn around the company. The group was good at its core business of making cables for bridges that span both China’s rivers and those outside the country. Shanghai Pujiang won the international contract for the restoration of the San Francisco-Oakland Bay Bridge, handily defeating Nippon Steel, partly by citing a price that was 30 per cent lower but also because its quality was sufficiently high.

Mr Zhang is a rare creature, an optimist about mainland prospects on both a macro and micro level. He believes that before President Xi Jinping’s anti-corruption drive, misbehaviour and self-dealing were rampant. The private sector firms in which he invested were barely profitable because they spent so much money on banquets for officials and under-the-table red envelopes of cash, he says. Now, such behaviour has ceased.

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## 上海浦江缆索公司翻身记

桑晓霓：这家中国国企从经营惨淡、无法偿还银行贷款到赢得国际合同，无论是否例外，这个故事至少令人振奋。

当上海元昊投资管理有限公司(Yuanhao Capital)创始人张炜几年前去上海浦江缆索股份有限公司(Shanghai Pujiang Cable)的时候，这家国有企业经营惨淡，无法偿还银行贷款。

但张炜的司机却对这家公司印象深刻。张炜对司机竟然有看法感到意外，他回忆道："我问他为何对这家公司这么印象深刻。他告诉我说，你看到停放管理层车辆的停车场了吗？那里至少有 20 辆豪车。"

司机看到的是财力，他的老板看到的是中国大多数国企的通病。当时，浦江缆索最高级别的员工每月薪资只有大约 3000 元人民币（合 450 美元）。意料之中的是，这家制造公司的几乎所有主要供应商都是由高级管理层的亲戚把持；几乎每个能够与关联方交易的人都在与关联方交易，而且大肆虚报费用。没有人考虑客户经常多年拖欠货款的问题，更别提努力收款了。

张炜记得："所有人都在舞弊，许多收据都是假的。你甚至可以在业务报销单据中发现购买尿不湿的收据。所有人都在抢劫这家公司。"

现在，国有企业（尤其是在钢铁等重工业）似乎无法破除的盈利不足顽疾正在滋生大面积的绝望。

麦肯锡全球研究所(McKinsey Global Institute)的一份关于中国生产率的研究报告显示，钢铁业是资本回报率低于资本成本的行业之一。中国欧盟商会(European Union Chamber of Commerce in China)最近发表报告指出，中国"钢铁产量完全脱离市场实际需求，现在是第二到第五大钢铁生产国产量总和的两倍多"，这让人感觉到这个问题有多么严重。欧洲钢铁行业，包括全球最大钢铁公司安赛乐米塔尔(ArcelorMittal)，就是中国内地钢铁公司过剩产能的受害者之一。

即便是宝钢集团(Baosteel Group)与武汉钢铁(Wuhan Iron & Steel)合并以优化产能的消息也没有打消投资者的悲观情绪。宝钢和武钢属于中国规模最大、现代化程度最高的钢铁生产商。

然而，张炜并非这些悲观者中的一员。他在收购浦江缆索后的经历颇具启发意义。通过提高薪资和改变激励制度，他降低了经理中饱私囊的动机。他说："所有人都在侵占。他们需要明白，他们在侵占自己的东西。"

张炜想扭转公司命运，他还有许多事情要做。浦江缆索非常擅长自己的核心业务，为横跨国内外江河的桥梁制造缆索。该公司曾轻松击败新日本制铁(Nippon Steel)，赢得美国旧金山奥克兰海湾大桥修复工程的国际合同，一定程度上是因为其报价低 30%，但也是因为它的产品质量足够高。

张炜与众不同，无论是宏观还是微观层面都对内地前景保持乐观。他认为，在中国国家主席习近平开展反腐运动之前，不当行为和自我交易非常猖獗。他说，他投资的民营公司很少有盈利的，因为它们花了很多钱用于宴请官员和私下红包贿赂。现在，此类行为杜绝了。

然而，如今中国商人很少像张炜那么乐观。他们担心，起初被盛赞的反腐运动已沦为令人想起“文化大革命”的政治迫害。或许这是因为太多的财富产生于见不得光的非正当手段。由于担心被视为腐败，党政官员也更不愿做出决策，这让企业更难实施它们的计划。对中国已经放缓的经济增长而言，这种影响是灾难性的。此外规则的实施也缺乏一致——谁获准将资金带出境而谁不准，谁获得贷款而谁不能获得贷款——这些事情依然让体制内外的人们摸不着头脑。

但浦江缆索的故事至少令人振奋，无论它是否是一个例外。

# Chinese default exposes creditor anger at political interference

A series of bond defaults in north-east China is exposing creditors' frustration at the lack of a transparent process for resolving bad debt as cash-strapped local governments step back increasingly from taxpayer bailouts.

President Xi Jinping's push for "supply-side reform" is centred on cutting excess capacity and paring back credit to so-called zombie companies, many of them state-owned. That is setting up conflicts between creditors and local governments that rely on state factories for employment and tax revenue.

Dongbei Special Steel, majority-owned by Liaoning province, has defaulted seven times on bond principal and interest payments worth Rmb4.8bn ($715m). In March its chairman was found dead.

In a sign of creditors' mounting frustration, Dongbei Special bondholders circulated a draft petition last week calling on the main bond market regulator to take the unprecedented step of suspending approvals for all Liaoning-based companies.

Ivan Chung, head of Greater China credit research at Moody's in Hong Kong, said: "As there is no standard resolution platform or avenues — for example, court procedures — for bondholders to recover their claims after default, the bondholders may turn aggressive when the issuer is not co-operative."

North-east China, which is deeply reliant on state-owned heavy industry, has been the hardest hit by the economic slowdown, and more defaults are expected. How the latest case is resolved could set a precedent for creditor rights in similar cases.

Bonds issued by state-owned enterprises were long considered to carry an implicit guarantee. That perception is changing following a series of SOE defaults over the past year. Overall, 17 Chinese companies have defaulted on domestic bonds in 2016 compared with 18 in 2015, according to Wind Information.

Formal bankruptcies have surged over the past year after years in which debt disputes were mostly resolved through backroom negotiation. But most of those cases involve small, privately owned companies. In cases involving large SOEs, local governments still influence courts away from accepting bankruptcy petitions.

Lou Jiwei, finance minister, said on Sunday that the government will not intervene in corporate defaults unless the case poses a systemic risk.

Mr Chung said commercial banks, the main investors in Chinese corporate bonds, are more willing to challenge local governments to protect their balance sheets. In the past, lenders were willing to swallow some credit losses to maintain good political relations viewed as crucial for their broader regional businesses.

The latest bondholder proposal has removed the call for cutting off bond finance to all of Liaoning, according to the official China Securities News, but tensions remain.

Investors are angry that Dongbei Special last week proposed swapping 70 per cent of its outstanding debt for equity, violating a pledge made in May not to engage in such swaps. They were also frustrated that Dongbei Special's chairman did not attend the first two bondholder meetings. The company declined to comment.

Jeffrey Qi, portfolio manager at E-Fund Management in Hong Kong, who invests in Chinese domestic bonds, said: "Of course creditors would love to have a bailout, but that's not really the main issue. The problem now is the government won't offer a bailout, but they also won't allow a legal process of bankruptcy and liquidation. If they used a standard legal process, creditors wouldn't have anything to complain about."

## 中国违约个案突显债权人不满干预

投资界人士称，真正的问题是地方政府一方面不再愿意出手纾困，另一方面也不允许破产清算的法律程序。

中国东北发生的一连串债券违约使债权人对于缺乏透明的坏债处置过程表露出郁闷。现金拮据的地方政府日趋不愿动用纳税人资金出手纾困。

中国国家主席习近平推动的"供给侧改革"的中心内容，是削减过剩产能和减少向所谓的僵尸公司（其中有很多是国有企业）发放信贷。这一努力正使债权人和依赖国营工厂提供就业和税收的地方政府之间产生冲突。

辽宁省政府拥有多数股权的东北特钢(Dongbei Special Steel)已经七次违约，涉及总计 48 亿元人民币（合 7.15 亿美元）的债券本金和利息。今年 3 月，该公司董事长被发现死亡。

突显债权人越来越郁闷的一个迹象是，东北特钢债券持有人上周散发了一份请愿书草案，呼吁主要债券市场监管机构采取前所未有的步骤，暂停审批所有辽宁企业的发债申请。

穆迪(Moody's)在香港的大中华区信用研究部门负责人钟汶权(Ivan Chung)表示："由于没有标准的处置平台或渠道——比如法庭程序——可以让债券持有人在违约发生后收回自己的债权，当发行人不合作时，债券持有人可能变得咄咄逼人。"

深度依赖国有重工业的中国东北，是近年经济放缓的重灾区，预计还会发生更多违约。最新的违约案如何解决，可能为类似个案中的债权人权利设定先例。

国企发行的债券曾经长期被视为带有隐性担保。过去一年发生一连串国企违约后，这种观念正在转变。万得资讯(Wind Information)的数据显示，总体来看，2016 年中国已经有 17 家企业发生国内债券违约，而 2015 年全年的数字是 18 家。

经过多年主要通过幕后谈判解决债务纠纷之后，过去一年正式破产数量飙升。但多数破产案涉及规模较小的私有企业。在涉及大型国企的情况下，地方政府仍然对法院施加影响，要求其不受理破产申请。

中国财政部长楼继伟周日表示，政府将不会干预企业违约，除非相关个案构成系统性风险。

穆迪的钟汶权表示，作为中国企业债券的主要投资者，商业银行现在更愿意挑战地方政府以保护自己的资产负债表。过去，银行更愿意承受一些信贷亏损以保持良好的政治关系，这被视为在整体上对它们在地区的业务至关重要。

据官方的《中国证券报》报道，新版债券持有人提议删除了切断辽宁所有债券融资渠道的呼吁，但紧张气氛依然存在。

投资者感到愤怒的是，东北特钢上周提出将其未偿债务的 70%置换为股权，违反了 5 月份作出的不搞这种债转股的承诺。他们还对东北特钢董事长没有出席最初两次债券持有人会议表示不满。该公司拒绝置评。

易方达资产管理（香港）公司(E-Fund Management in Hong Kong)投资组合经理、投资于中国国内债券的 Jeffrey Qi 表示："债权人当然很想得到纾困，但那并不真是主要问题。现在的问题是政府不会提供纾困，但他们也不允许破产清算的法律程序。如果让他们利用标准法律程序，债权人就没什么可抱怨的。"

# Peru’s new government wants more mining, more China

Peru's new president to expand into mineral refining as conflicts over jobs and environmental standards rumble on, reports Nelly Luna

Peru’s new president Pedro Pablo Kuczynski (known as PPK), has revealed his government’s intention to prioritise mineral extraction and trade relations with China in a series of actions and public statements. Since his victory in an election run-off on June 5, Kuczynski has also declared the need for Peru to stimulate further economic activity by processing and refining minerals, in addition to simply exporting them.

China is Peru’s biggest investor. With this in mind Kuczynski, who will replace the outgoing Ollanta Humala at the end of the month, described as “necessary” a trip to China ahead of the Asia-Pacific Economic Cooperation (APEC) forum in Lima in November, his first official overseas visit. “China is our number one trading partner and they are the ones who purchase our minerals,” he said.

“We are an economy of enormous natural resources, but we have to industrialise and that is not easy to do. So we will have to work with those who buy significant amounts of our exports, which to a large extent, means China,” Kuczynski said during the 11th Business Summit of the Chile-Pacific Alliance in Lima in June.

Peru’s relations with China date back many years before the latter’s wave of trade and investment deals with other South American countries, and have strengthened in recent years. However, three major mining projects – Río Blanco in northern Piura region, Toromocho in the Central Andes, and Las Bambas in the Apurímac region – each have unresolved social conflicts, according to the ombudsman (Defensoría del Pueblo).

Chinese investments are welcome, but they have to comply with environmental standards

José Luis López Follegati, an expert on mining and social conflicts said: “Chinese investments are welcome, but they have to comply with the standards of environmental and social responsibility in Peru. The state can’t just decide to promote investment [in mining] without first consulting with local communities.”

Las Bambas requires investment of US$5.8 billion and López Follegati expressed optimism about roundtable discussions aimed at getting the state to prioritise the development of the area. One of the main causes of conflict at Las Bambas is the lack of job opportunities beyond the initial construction phase. López Follegati pointed out that only 15% of the state investment programme has been carried out and local residents are demanding that it do more. There are currently four or five mining projects in existence in the area, improving the connectivity of which could offer more employment opportunities.

The future of investments

China is not simply Peru’s principal mining investor. As of last year, it has partnered with the Peruvian government in the controversial project to construct an 8,000 kilometre railway that would traverse South America and better connect Peru’s Pacific ports with the Chinese port of Tianjin. Various civil society organisations have warned about the environmental impact on Amazon forests. Technical studies have not been been carried out to determine the viability of the megaproject.

But according to Peruvian newspaper El Comercio, which had access to the memorandum of understanding to build the railway signed in 2014, assessments are the responsibility of China Railway Corporation and China Railway Engineering Eryuan Group (for China), Brazil’s Corporate Planning and Logistics Company, and Peru's Highways and Railways Department, which reports to the Ministry of Transport.

The total value of bilateral trade between Peru and China currently stands at some US$15 billion. The two countries signed a free trade agreement on March 1 2010. Kuczynski reiterated the need to strengthen these ties and to promote the processing of minerals. However, one of the main metallurgical complexes in the country, La Oroya, is currently in receivership and was responsible for one of the most serious incidents of lead contamination in Peru.

Pointing to the copper refinery at Ilo on the Pacific coast, López Follegati said that Peru has the capacity, technology and experience to process minerals: “Peru has gleaned at least 30 or 40 years’ experience in processing minerals. But more could be done if one could extract more products such as copper, silver and zinc.” However, López Follegati acknowledged that La Oroya “needs to be modernised, and to answer for its environmental policies”.

Different perspectives

In recent years, Peru’s growth has slowed from 6% per annum to an estimated 3% this year, according to the International Monetary Fund’s World Economic Outlook report. There are various explanations for this fall, but the consensus is that it is associated with the fall in international commodity prices and China’s economic slowdown.

“We are primarily an exporting country,” said Waldo Mendoza of the Catholic University, Lima. “What we have seen in recent years are the leftovers from that bonanza era, because the investments made in those earlier years have matured in 2015 and 2016. What is happening now is a period in which that engine has shut off, and looks like it will be shut down for an extended period,” he added.

Kuczynski said he wants to improve growth rates by reactivating mining investments. However, the opposition Frente Amplio (Broad Front), the leftist coalition that obtained 20 seats in congress in the elections and which supported Kuczynski’s candidacy against Keiko Fujimori in the runoff, has a different view on the economic model that the new government should prioritise.

Tania Pariona, a Frente Amplio congresswoman, insists that it is time for the Peruvian economy to stop focusing on growth based on the extraction of minerals: “The country needs to make a realistic projection of its investments taking the limits of the environment into account, respecting life and other products coming from the communities where resources are extracted,” she told Diálogo Chino, chinadialogue's sister site, adding; “what future is there for economic growth if human development is not taken into consideration?”

Pariona stated that in order to resolve ongoing social conflicts, companies and the state needed to “strengthen mechanisms of dialogue with communities” and in good faith. “This is fundamental and we have said it on various occasions. The state must have a more timely and effective presence in the areas where conflicts arise.”

The Frente Amplio has said that it will be introducing a legislative initiative to revoke a series of measures known as the Paquetazo ambiental or “environmental package” (Paquetazo refers to the shock neoliberal economic reform packages introduced in some Latin American countries in the 1980s and 1990s) which aims to incentivise investment through weaker regulations. Among other issues, the reforms would make environmental audits more flexible.

When contacted, Kucznski’s technical team refused to comment officially on these matters, as did representatives of the majority party Popular Force, led by Keiko Fujimori. For his part, Lopez Follegati insisted that “it is important to strengthen Peru’s Environmental Assessment and Enforcement Agency (OEFA) and the use of new and better technologies and environmental guarantees, but sanctions must also be imposed”.

A former economy minister from the political right wing, Kuczynski’s Peruanos Por el Kambio party has only 18 seats in congress and it will be difficult for his government to implement its new agenda.

On November 2, Peru and China will celebrate 45 years of diplomatic relations and on November 19, Kuczynski will host the APEC Forum 2016, attended by President Xi Jinping.In the coming weeks, Kuczynski will announce his cabinet but for now, his attention is on China with key dates in the coming months.

# 秘鲁新政府期待与中国扩大采矿合作

为了解决就业需求，库琴斯基领导下的秘鲁新政府想要扩大矿产冶炼，但环境标准成为难以逾越的困难。

秘鲁新总统佩德罗·巴勃罗·库琴斯基通过一系列行动和公开声明,表明了其优先与中国在采矿、贸易等领域展开合作的政策倾向。自从他在 6 月 5 日赢得大选以来，库琴斯基宣称秘鲁必须通过矿产加工和冶炼来进一步刺激经济，而非单纯地进行开采。

中国是秘鲁最大的投资国。库琴斯基（将在本月末替代卸任的奥良塔·乌马拉）正是牢记这一点，将 11 月利马亚太经合组织(APEC)峰会之前的中国之行视为“必行”的访问，这也是他上任后的首次正式外访。他说：“中国是我们的头号贸易伙伴，也是我们矿产的购买者。”

“我们是一个自然资源丰富的经济体，但必须实现工业化，这并不容易。因此。我们必须与那些大量购买我们出口产品的伙伴合作，而这个伙伴很大程度上就是指中国。”库琴斯基 6 月在利马举行的智利太平洋联盟第十一届商业峰会上如是说。

秘鲁与中国的关系源远流长，比中国与其他南美国家的贸易和投资高潮还要早上很多年，且近年来不断增强。但是，据秘鲁巡视官（刑事护民官）所说，中秘间的三大采矿项目（北皮乌拉地区的白河铜矿、中安第斯地区的特罗莫克铜矿和阿普里马克地区的拉斯邦巴斯铜矿）都存在尚未解决的社会冲突。

采矿与社会冲突问题专家胡塞·洛佩兹-佛洛加蒂在接受中拉对话采访时说：“我们欢迎中国投资，但他们必须遵守秘鲁的环境和社会责任标准。国家不能在没有与当地社区协商的情况下就决定引入（采矿）投资。”

其中，拉斯邦巴斯铜矿的开发需要 58 亿美元的投资。洛佩兹-佛洛加蒂对于旨在让国家优先发展该区域的圆桌讨论表示乐观。拉斯邦巴斯冲突的主要原因之一是初始建设阶段之后缺乏就业机会，洛佩兹-佛洛加蒂指出，国家的投资计划只落实了 15%，当地居民要求进行更多投资。目前该地区有四五个采矿项目，如果能改善各项目间的互联互通，可以带来更多的就业机会。

投资的未来

中国不仅仅是秘鲁主要的采矿投资国。就在去年，中国与秘鲁政府达成了修建南美洲两洋铁路的项目协议。这一充满争议的 铁路长达 8000 公里，将加强秘鲁太平洋港口与中国天津港之间的联通。但是，各种各样的市民社会组织都就该项目对亚马逊森林的环境影响提出警告。关于项目可行性和线路的技术研究尚未进行，据秘鲁《商报》（该报曾搞到了 2014 年两洋铁路项目的谅解备忘录签署）报道，评估将由中国铁路总公司和中铁二院工程集团、巴西的企业规划与物流公司以及秘鲁交通部下属的高速公路与铁路局负责。

目前秘鲁与中国的双边贸易总额为 150 亿美元，两国在 2010 年 3 月 1 日签署了一个自由贸易协定。库琴斯基重申了强化中秘贸易关系及发展矿产加工的必要性。然而，秘鲁主要冶金企业之一的拉奥罗亚工厂正在进行破产清算，该企业是秘鲁一起最严重的铅污染事件的罪魁祸首。

洛佩兹-佛洛加蒂用太平洋沿岸的伊洛铜冶炼厂做例子，指出秘鲁有能力、有技术、也有经验进行矿产加工。他说：“秘鲁在矿产加工方面已经有至少三四十年的经验，如果能够开采更多的铜、银和锌等，我们的产量可以更多。”但是，他也承认拉奥罗亚工厂“需要现代化，并对其环境政策作出调整”。

不同的视角

国际货币基金组织的《世界经济展望》报告显示，近年来，秘鲁的经济年增长速度从 6%下降到今年的 3%。对于这一下降的解释多种多样，但广泛的共识是这与国际大宗商品价格下滑以及中国经济放缓有关。

利马天主教大学的瓦尔多·门多萨说：“我们首先是一个出口型国家，近年来我们都靠吃‘富矿’时期的老本儿过日子，因为前些年获得的投资在 2015 年和 2016 年均已到期。如今的情形就是发展引擎正在关闭，而且看起来这一局面未来还要持续更长时间。”

库琴斯基说他要通过重新发挥采矿投资的作用来提高增长率。但是，左派联盟广泛阵线（在国会获得 20 个议席并在大选中支持库琴斯基击败了藤森惠子）对于新政府推崇的经济模式不以为然。

广泛阵线的国会女议员塔尼娅·帕里奥娜坚持说，现在秘鲁经济不应该再把重点放在以矿产开采为基础的增长上。她在接受中拉对话采访时说：“国家需要对投资进行现实的规划，将环境的限制纳入考量，

尊重生命和资源开采地社区的其他要素。如果不考虑人的发展，经济增长的未来在哪里呢？”

帕里奥娜声称，为了解决持续不断的社会冲突，企业和国家必须“加强与社区的对话机制”，并保持良好信用。“这一点至关重要，我们在各种场合不断强调。国家必须在冲突发生地区采取更加及时和有效的措施。”

广泛阵线已经表示将采取立法行动，废除一系列被合称为“环境包”的法案。这些法案的目的就是通过放松管制来刺激投资，其内容包括通过改革让环境审查更加灵活。

然而，当接到中拉对话的联系要求进行采访时，无论库琴斯基的技术团队还是藤森惠子领导的多数党——人民力量党都拒绝对这些问题作出公开评论。在这一点上，洛佩兹-佛洛加蒂坚持说：“重要的是要强化秘鲁的环境评估监察局 （OEFA），加强先进新技术的利用和环境保障，但制裁也必须到位。”

来自右翼党派的前经济部长库琴斯基的“为了变革秘鲁人”党在国会仅获得 18 个议席，这让他的政府很难落实自己的新计划。未来几周内，库琴斯基将宣布内阁名单。但目前他的注意力都放在中国身上，接下来几个月双方有多个重要“约会”。11 月 2 日，秘鲁与中国将庆祝建交 45 周年；11 月 19 日，习近平将赴利马参加库琴斯基主办的 2016 年 APEC 峰会。

# *Clean Energy（清洁能源）*

## Political Pressure on EU Countries Using Russian Nuclear Fuel Mounting

According to a TVEL annual report, political pressure on EU countries using Russian nuclear fuel is mounting.

The EU countries, where Russia-designed nuclear power plants are used, are experiencing an increased political pressure explained through the necessity to reduce energy dependence on Russia, TVEL fuel company said in an annual 2015 report.

"There is a growing political pressure, the thesis of the necessity to reduce energy dependence on Russia and diversification of supply sources which can be used as means of restricting competition are being actively promoted," the report of TVEL, which is part of the state-owned Rosatom nuclear energy corporation, read.

Experts suggested earlier that there was a reasonable doubt that some European nuclear power plants designed using Soviet or Russian technologies would be able to operate without incidents on non-Russian nuclear fuel.

## 欧盟国家使用俄罗斯核燃料遭遇政治压力

据 TVEL 年度报告，欧盟国家使用俄罗斯核燃料，政治压力越来越大。

欧盟国家使用俄罗斯设计的核电站，TVEL 燃料公司在 2015 年年度报告中称，随着政治压力增大，通过减少能源对俄罗斯依赖的必要性。

“政治压力增长，减少对俄罗斯的能源依赖必要性，增加供应来源的多样化，可以用作积极推动限制竞争的手段，“TVEL 报告作为国有核能公司 Rosatom 的一部分。

之前，根据合理猜想，专家建议，一些欧洲核电站设计使用苏联或俄罗斯技术能够操作非俄罗斯核燃料。

# Hinkley decision threatens UK ‘golden era’ with China

Theresa May’s postponement in approving the Hinkley Point nuclear power station is a heavy blow to her predecessor’s attempts to cultivate China as a key investment and strategic partner.

The UK and China had proclaimed a “golden era” of commercial and diplomatic relations, and president Xi Jinping in October referred to the investment in Hinkley Point as a “flagship project” of bilateral co-operation.

Chinese officials have been clear that if Hinkley does not now go ahead, there would be little chance that the “golden era” would ever get off the ground. Failure of the deal would be damaging to Chinese ambitions that reach far beyond the project itself.

Beijing saw George Osborne and David Cameron, the former chancellor and prime minister, as the “dream team” in elevating bilateral ties to an unprecedented level of warmth and co-operative deals, according to one Chinese official. Theresa May’s government appears much more circumspect.

The issue is particularly awkward for Mrs May’s government because it is clear that London’s reservations on the project are neither technical nor commercial but political in nature, said Kerry Brown, professor of Chinese Studies at King’s College, London.

“The Chinese will be watching with hawkish eyes to see whether now that Osborne has gone the golden era has any remnants left,” he said.

Chinese investors’ proposed partnership in the reactor led by EDF of France was a cornerstone of Britain’s energy policy and a prestige project for the Chinese state. Chinese nuclear firms were promised they could develop a future reactor — most likely of their own design — if they took a minority stake in Hinkley Point.

Chinese investors led by China General Nuclear Power have been steadfast in their support for the reactor, even as mounting costs at similar reactors under construction in Europe and China led to fierce internal opposition at EDF. Beijing hopes that a successful reactor project in the UK would help its push to market its indigenously-designed Hualong One reactor overseas.

If the deal is shelved, it may be felt by Mr Xi as a personal rebuff. Not only did he sign the deal on Hinkley with Mr Cameron, the Chinese companies that were due to undertake the project — China National Nuclear Corporation (CNNC) and China Guangdong Nuclear Power — are constituents of the military-industrial complex that bolsters Mr Xi’s power base.

The companies have seen the recognition that helping to build a power plant in the UK gives them as a springboard to the international market. A month after the Hinkley deal was announced, CNNC won a $15bn contract to build two power stations in Argentina using China’s homegrown technology.

Mrs May’s reservations appear directly related to the potential national security concerns posed by Chinese involvement, challenging the basic premise of Britain’s push to attract Chinese investment.

Mrs May has been sensitive to the international implications of her decision. She warned French president François Hollande twice that she intended to delay her decision, although EDF’s board appeared to be unaware of that warning when they narrowly voted to approve the reactor on Thursday.

Similarly, the Chinese government was told on Wednesday evening — London time — that a decision would not come until the autumn. Chinese government and nuclear industry officials were “all set” to travel to the UK for a signing ceremony, but cancelled the trip after the message from London arrived.

## 分析：核电项目推迟影响中英关系？

英国首相梅在欣克利角核电项目上变卦，意味着前首相卡梅伦和前财相奥斯本打造的英中“黄金时代”

出现变数。

英国首相特里萨•梅(Theresa May)推迟批准欣克利角(Hinkley Point)核电站，这对其前任将中国培育为关键投资和战略合作伙伴的努力是沉重打击。

英中曾宣称进入商业和外交关系的“黄金时代”，中国国家主席习近平去年 10 月将欣克利角投资誉为双边合作关系的“旗舰项目”。

中国官员明确表示，如果欣克利角项目现在不能启动，“黄金时代”开启的机会渺茫。这项合作的失败将会损害中国的雄心，受损范围远超项目本身。

据一位中国官员称，中国政府将英国前财相乔治•奥斯本(George Osborne)和前首相戴维•卡梅伦(David Cameron)视为推动双边关系达到空前友好和合作高度的“梦幻团队”。特里萨•梅的政府似乎要谨慎得多。

伦敦国王学院(King’s College)的中国研究教授克里•布朗(Kerry Brown)表示，这个问题对梅政府尤其尴尬，因为伦敦方面在这个项目上的保留态度不是出于技术或商业上的原因，而是具有政治性质。

他说：“中国人将会密切关注，既然奥斯本已经走人，黄金时代是否还剩下什么。”

中国投资者在法国电力集团(EDF)牵头建设的核电项目上拟议的合作，曾是英国能源政策的一块基石，也是中国政府的一个“面子工程”。中国核电企业当初得到的承诺是，如果在欣克利角核电站持有少数股权，它们有望开发一个未来的核反应堆——很可能采用它们自己的设计。

以中国广核集团(China General Nuclear Power Group)为首的中国投资者，一直坚定支持该项目，即便欧洲和中国在建的类似核电站成本攀升激起法国电力集团内部的强烈反对。中国政府希望，在英国的核电项目若取得成功，将有助于将其自主设计的“华龙一号”核反应堆推向海外市场。

如果这项合作被搁置，习近平可能会感受到一种个人挫败感。他不仅与卡梅伦签订了欣克利角核电站协议，而且承接该项目的中国企业——中国核工业集团(China National Nuclear Corp)以及中国广核集团——属于支撑习近平权力基础的军工企业。

这些企业把帮助在英国建设核电站视为进军全球市场的跳板。在欣克利角核电站协议宣布一个月后，中国核工业集团赢得了一项价值 150 亿美元的合同，拟利用中国自主开发的技术在阿根廷建造两家核电站。

梅的保留态度似乎与中国企业介入可能构成国家安全担忧直接相关，这将挑战英国吸引中国投资的基本前提。

梅对自己所作决定的国际影响相当敏感。她曾两次警告法国总统弗朗索瓦•奥朗德(François Hollande)称，她打算推迟决定，尽管法国电力董事会在上周四以微弱多数投票批准该项目时，似乎不知道梅发出了警告。

类似地，上周三晚（伦敦时间），中国政府被告知，英国要到秋季才会做出决定。中国政府和核电行业官员原本已准备好赴英国参加签约仪式，但在接到伦敦的消息后取消了行程。

# Web of denial: the US Senate climate campaign is critical

Democrats are stepping up their fight against the well-organised misinformation campaign on climate change, write Robert Brulle and Timmons Roberts

Despite overwhelming scientific evidence of climate change, the misinformation campaign has functioned as an effective barrier to action on climate change for nearly thirty years.

It has done so by refuting evidence that climate change is real, human-caused, and requires aggressive action by the US.

Building on decades of social science research and over 100 peer-reviewed articles, 19 senators took to the floor

last week to document and critique a series of think tanks and trade associations, which comprise what they called “the web of denial.”

Rhode Island senator Sheldon Whitehouse, who has courageously staked out this position over the last four years in a series of over 140 floor speeches, led the group.

This time he stood at the front of a phalanx of 19 senators, including democratic leaders in the Senate, who were willing to speak out about the dangerous impact of climate denial front groups.

The speeches supported a senate resolution which argues that: “fossil fuel companies…developed a sophisticated and deceitful campaign that funded think tanks and front groups, and paid public relations firms to deny, counter, and obfuscate peer reviewed research, and use that misinformation campaign to mislead the public and cast doubt in order to protect their financial interest.”

Introduced by senators Bernie Sanders, Ed Markey, Brian Schatz, Barbara Boxer, Jeff Merkley, Elizabeth Warren, Al Franken and Whitehouse the resolution is a clear indication that if the Democrats gain a majority in the November's presidential elections, they will probably investigate fossil fuel firms and the actions of their front groups.

Resolution supporters compare the behaviour of fossil fuel companies today to that of the tobacco industry decades ago, which deliberately distorted and suppressed scientific findings that proved the dangers of smoking.

These senators are making an important attempt to reorient the debate around climate action away from climate denial, to exposing how the vested interests of the fossil fuel industry use their political and economic power to systematically undermine action.

The events in the Senate raise crucial issues of reason, democracy, and openness, and it will be very interesting to see what comes next. One can certainly anticipate that actors in the web of denial will mobilise in response to these speeches.

What happened

Over two days, nineteen different senators took to the floor and spoke. Senate minority leader Harry Reid spoke about Americans for Prosperity, a group that received over US$1 billion (6.7 billion yuan) in funding from the Koch foundations, which is fossil fuel funded.

Senator Jeanne Shaheen of New Hampshire described the Competitive Enterprise Institute, funded directly by oil and coal companies, a group which have been leaders of the misinformation movement on climate change in the name of protecting liberty.

The list of groups these speeches documented is stunning in both the number of shadowy institutes, and the impact they have had in delaying action needed to protect our children and vulnerable people around the world.

For example, senator Tom Udall talked about Western Fuels Association, the coal industry group that has made outlandish claims about the benefits of greater levels of CO2 in the atmosphere.

While senator Tim Kaine, potential vice presidential pick for Hillary Clinton, talked about the impacts of climate change on his state of Virginia, especially the massive Norfolk naval base that is threatened by sea level rise.

Kaine talked about the Science and Public Policy Institute, which denies sea level rise and the climate change crisis; and the Donors Capital Fund, which hides where its funding comes from.

The list goes on. Senator Schatz talked about the deceptively named Center for Study of Carbon Dioxide and Global Change and the heavy-hitting Heartland Institute. Heartland continues to hold “counter conferences” at the UN negotiations, this year at the Hotel California in Paris.

One of the most destructive of the web's members has been the US Chamber of Commerce. Millions of small businesses join the organisation in ignorance of the savage lobbying and campaign attacks against responsible action to prevent climate change undertaken in their names.

Why it matters

The US Senate has been key to climate change inaction globally because international treaties have to first pass through the chamber with a super-majority in order to be ratified. Due in part to the Byrd-Hagel Resolution in 1997, the US Senate never voted to ratify the Kyoto Protocol.

The US is a crucial place for climate action: its foot-dragging has arguably set back global progress on the issue for 15 or even 25 years. Dragging the web of denial into the light makes clear that these decades of inaction have not occurred by chance.

Last week's happenings are important because Senate Democrats have unified to expose and oppose the network of organisations engaged in the effort to systematically distort information on climate change. Scholarly research shows that these institutes received nearly a billion dollars in funding to promulgate a series of neoliberal causes, including misinformation on the causes and impacts of climate change.

Watch for the backlash. Already, a public release from the Energy and Environment Institute (which has twice been renamed recently) called the Senate effort a "fundraising" and "publicity stunt" for the Democratic Party, distracting the nation from other pressing issues.

The issue of manipulation of public perception of science is reflective of a much larger problem in America today: political inequality has allowed vested interests to hijack and distort discourse and democratic governance, crippling our ability to act on the key challenges of our time.

# 美国参议院气候行动：牵一发而动全身

罗伯特·布吕莱和蒂蒙斯·罗伯茨认为，美国民主党已经开始着手积极对抗有组织地歪曲气候变化相关信息的宣传活动。

尽管气候变化问题已经获得了大量科学研究的佐证，但是在过去 30 年里，用错误信息混淆视听的宣传活动仍然在阻碍着气候变化相关行动的有效开展。

这类活动否认气候变化的真实性，不承认人为原因造成了这些变化，而且拒绝美国方面采取相关积极措施。

上周，19 位参议员以数十年的社科研究成果和 100 余份同行评审文章为依据，开始对一系列智库与贸易协会组成的所谓的"否定（气候变化）网络"进行记录和批判。

罗德岛参议员谢尔顿·怀特豪斯在过去 4 年的 140 多场登台演说中明确表达了自己的立场，可谓是整个议员小组的核心人物。

如今，谢尔顿不再是孤军奋战，他的身后还有另外 18 位参议员与他一起勇敢地站出来，呼吁各方警惕那些否认气候变化的团体造成的危险影响，其中不乏参议院中重量级的民主党领导人物。

谢尔顿的演讲让每一位参议员都开始关注自己所在州的"否认（气候变化）网络"的主要成员。此外，演讲也促成了一项参议院决议的达成，该决议认为："化石燃料公司……发起了一场复杂而虚伪的宣传活动。他们资助了一些智库和所谓合法组织，并且雇佣公关公司， 否认、回击甚至混淆同行评审研究，并且利用错误信息误导公众，引发公众质疑，从而保护自己公司的经济利益。"

这项决议由参议员怀特豪斯、马基、沙茨、博克瑟）、莫克雷、沃伦、桑德斯和弗兰肯共同发起。该决议表明，如果民主党在今年 11 月的大选中获得多数席位，那么他们很有可能将对上述公司和合法组织的活动展开调查，甚至会建议美国司法部长进行后续跟进。

这些公司和组织的行动模式就跟几十年前烟草行业歪曲和打压科学成果及影响的模式如出一辙。

尽管同行互审学术文献中否认气候变化的内容越来越多，但是因为新闻报道规范要求记者提供正反两面关观点，广大媒体记者还是倾向于将这类信息看作某些情况下的合法观点，而不是我们认为的那种有组织的活动。

这些参议员正在努力重新定位这场争辩，不再将矛头指向否定气候变化的危害性，而是希望大家能够尽早认识到化石燃料行业是如何从自身利益出发，利用其政治经济实力对我们的气候变化应对行动进行系统性破坏。

当然，这也引发了一系列关于理性、民主和开放问题的讨论，未来事态发展应该也会很有意思。可以肯定的是，这些否定网络中的“主演”还有他们背后的政治喉舌肯定会对参议员们的演讲做出回应。所以，我们对这样的争锋拭目以待。

到底发生了什么

过去 2 天里，19 位参议员相继发表了演说。参议院少数派领导人哈里·里德谈到了繁荣美国人协会。该协会从科赫基金会获得了超过 10 亿美元的资金援助，而科赫背后的金主正是来自化石燃料行业。

新罕布什尔州参议员珍妮·沙欣则谈到了竞争企业协会。该协会由石油和煤炭企业直接赞助，他们打着保护自由的旗号，一直站在传播气候变化错误信息的前沿阵地。

19 位参议员的演讲中所述的这些组织，无论是就影子机构的总体数量来看，还是就其在保护全球儿童与弱势群体行动中的阻碍作用来说，都令人咋舌。

参议员尤德尔（Udall）则谈到了西部燃料联合会。这家煤炭行业组织竟然曾经公开表示，大气中的二氧化碳含量越高对人类就越有好处。

而希拉里·克林顿的潜在副总统候选人、参议员凯恩则谈到了气候变化对弗吉尼亚州的影响，并特别提及了海平面上升对诺福克海军基地的大规模影响。此外，凯恩（Kaine）还提到了科学与公共政策研究院和捐赠者资本基金两家机构，前者否认海平面上升和气候变化危机，而后者则拒绝透露机构的资金来源。

参议员沙茨则在演讲中提到了虚有其名的二氧化碳与全球变化研究中心，以及“赫赫有名”的哈兰学会。哈兰学会抵制联合国气候谈判的的保留项目—— “对抗者会议” 今年在巴黎加州旅馆召开。

要说这个网络里最具破坏力的，那还是要数美国商会。数百万小企业争相恐后地加入这个组织，尽管该机构曾经打着他们的旗号公然进行游说，并发起阻碍气候变化应对措施落实的相关活动。

这些演讲为什么这么重要？

美国参议院其实应该对全球气候变化应对措施的不作为负主要责任，因为只有国际条约在这个机构中获得多数通过，美国才能正式履行其条约义务。而且，在一定程度上由于 1997 年《伯瑞德-海格尔决议》的规定，美国参议院从未投票通过《京都议定书》。

过去几十年大气环境中温室气体的含量越来越高，美国应该负首要责任。所以美国也应该是气候行动的关键一环：而目前美国拖后腿的行为却已经将全球行动进程延后了 15 甚至 25 年。如今我们将否定行动网络的各个组织公布于众，就是要告诉大家，美国参议院过去几十年在气候变化方面的不作为绝非事出偶然。

上周发生的这一切非常重要，因为这表明参议院民主党已经就曝光和反对那些歪曲气候变化信息的机构达成了一致。学术研究显示，上述机构累计接受了近 10 亿美元的资助，用以发起一系列新自由主义宣传活动，包括发布一些有关气候变化成因和影响方面的错误信息。

这样一来，一场论战势必难免。比如，能源与环境研究院（近来已经进行过两次更名）就公开宣称，参议院此举其实是民主党进行“筹资”和“作秀”的一种方式，企图转移人们对国内其他紧迫事件的注意力。

操纵公众对科学的认知其实反映了美国当今社会的一个更大问题：政治不平等导致特权阶级可以绑架和扭曲话语权与民主统治，让我们无从应对我们这个时代所面临的问题。

## South African May thermal coal exports slip 2.8% on year to 6.48 mil mt

South Africa exported 6.48 million mt of thermal coal in May, down 2.8% year on year, due to falling shipments to Europe and Turkey, although exports to India continued to rise, according to customs data.

Continuously strong Richards Bay FOB spot prices have been hindering buying interest for South African thermal coal this year, making it uncompetitive against cheaper material from other origins, particularly to Europe and Turkey.

The volume was, however, 5.1% higher than April and its highest since December 2015, with shipments to India at the highest monthly volume since S&P Global Platts records began in April 2014.

The country took 4.46 million mt — or 68.8% of total exports — of South African thermal coal during the month, up 5% on-year and 1% higher than April.

Shipments to Europe in May fell 42% on the year and 44% from the previous month to 233,300 mt, the lowest amount since June 2015. There were no exports to the Netherlands, Spain, the UK or Germany, but Italy took 148,300 mt.

Turkey, which started the year as the third largest buyer of South African thermal coal, took none in May compared to 227,100 mt in the same month of 2015 and 61,100 mt in April.

One destination that took more coal in May was Pakistan at 460,000 mt, rising 46% on the year and 39% higher than the previous month.

Exports to the rest of Africa in May increased 13% on the year to 701,042 mt, while shipments to the Arabian Peninsula area jumped 92% from May last year to 350,000 mt.

Platts 7-45 day price assessment fluctuated around the $52-$53/mt FOB level in May, remaining relatively steady from the beginning of the month’s $52.30/mt to close at $52.10/mt FOB on May 31.

## 南非热五月份煤出口下滑 2.8%至 648 万吨

根据海关数据，虽然对印度出口继续增长，但由于欧洲和土耳其热能煤发货量下降，南非出口 648 万吨，同比下降了 2.8%。

理查兹湾 FOB 现货价格不断增长已经阻碍今年南方电煤的买盘利润，相较其他廉价的材料尤其是欧洲和土耳其，竞争力下降。

然而，成交量比 4 月高 5.1%，自 2015 年 12 月以来达到最高，自 2014 年 4 月标普全球普氏记录，运往印度最高月度卷。

南非热能煤国家出口 446 万吨或 68.8%的出口总额，同年高于增长 5%和同比 4 月高出 1%。

出口到欧洲 5 月下降了 42%，前一个月 233300 吨的 44%，2015 年 6 月以来的最低水平。没有出口到荷兰、西班牙、英国和德国，但是 148300 吨出口到意大利。

今年开始，土耳其是南非热能煤的第三大买家，5 月比同期 227100 吨和 2015 年 4 月的 61100 吨。

另一个出口目的地是巴基斯坦，更多的煤炭 460000 吨，较上年同期增长 46%，比上月增长 39%。

5 月份出口非洲其他国家增加 13%，至 701042 吨，同时阿拉伯半岛区域的出口量从去年 5 月增长 92%，达到了 350000 吨。

普氏 7-45 天价格评估波动在 52 - 53 美元/吨 FOB 水平，从开始的几个月，保持相对稳定的每公吨 52.30 美元，5 月 31 日收报 52.10 美元/吨 FOB 。

## China and Argentina reaffirm reactor agreement

China and Argentina have signed a memorandum of understanding (MOU) reaffirming their plans to construct

two new nuclear power reactors in the Latin American country with financing from Chinese banks. Construction of Argentina's fourth reactor is to start early next year.

Last November, Argentina signed deals with China for the construction of its fourth and fifth nuclear power plants: a third Candu pressurized heavy water reactor (PHWR) at the Atucha site and a pressurized water reactor (PWR) at an unspecified site. The projects are worth around $15 billion and China will contribute 85% of the required financing, according to a statement issued at that time by the Argentine president's office.

An MOU affirming the November agreement - made under the previous government of then-president Cristina Fernandez - was signed in Beijing yesterday by Argentina's minister of energy and mining Juan José Aranguren and Nur Bekri, director of China's National Energy Administration.

A statement from the Argentine ministry said, "According to the document, both Argentina and China commit to speed up negotiations to begin construction of the first of the two agreed units for the first quarter of 2017 and the second by 2019."

It added, "Thus, the Argentine government gives concrete signs of commitment to the expansion of power generation capacity and specifically in regard to nuclear power generation."

In July 2014, China and Argentina signed a new high-level agreement towards construction of a third pressurized heavy water reactor (PHWR) at the Atucha plant in Argentina. Through the agreement, China National Nuclear Corporation (CNNC) is to assist Nucleoeléctrica Argentina SA (NASA) by providing goods and services under long-term financing. That agreement was ratified in February 2015. The accord provides for NASA - holder of rights to Candu technology - to be designer, architect-engineer, builder and operator of the new reactor.

"China and Argentina, though a world apart, are in close nuclear cooperation," CNNC general manager Qian Zhimin was quoted as saying by the People's Daily. "The two countries share a tradition of friendship and both governments also attached much significance to nuclear cooperation."

## 中国和阿根廷重申核反应堆协议

中国与阿根廷已经签署了谅解备忘录，重申拉丁美洲国家建造两个新的核电反应堆的计划，这一计划由中方银行提供资金。阿根廷的第四个反应堆将于明年早期开始建造。

去年 11 月，阿根廷与中国签署建造第四个和第五个核电站的协议：第三个核电站坎杜重水堆在 Atucha，还有一个地点不确定。据阿根廷总统办公室发布的声明说，项目价值大约 150 亿万美元，中国提供所需资金的 85%。

谅解备忘录确认，前总统 Cristina Fernandez 领导的政府签署的 11 月的协议，昨日在北京，又由阿根廷能源矿业部长 Juan José Aranguren 和中国国家能源局主管 Nur Bekri 签署。

阿根廷政府部门的一份声明说道：“根据文件，阿根廷和中国致力于加速沟通建设 2017 年第一季度和 2019 年第二季度两个协议单位的第一个。”

声明补充道：“总之，阿根廷政府明确承诺扩大发电量，尤其是核电量。”

2014 年 7 月，中国与阿根廷新签署了一份有关在阿根廷 Atucha 建造第三个重水堆的高水平协议。通过协议，中国核工业集团公司将在长期资助下还提供商品和服务帮助阿根廷核电公司（NASA）。该协议在 2015 年 2 月获批。NASA—砍杜技术权利持有者—是设计者，建筑工程师，建造者以及新反应的运行者。

“中国和阿根廷，尽管分属世界不同部分，却有着紧密的核合作，”《人民日报》引用 CNNC 总经理钱智民的话说道，“两个国家素来有着友谊传统，两国政府也对核合作起着重要作用。”

## UAE nuclear energy plant passes safety tests

ABU DHABI // Safety tests have taken place at the Barakah Nuclear Energy Plant in the Western Region.

The Emirates Nuclear Energy Corporation carried out a structural test and an integrated leak rate test over several weeks at the plant in Al Gharbia.

The tests demonstrated the robustness of the structure and the plant's ability to perform safely under normal and extraordinary circumstances, said Mohamed Al Hammadi, chief executive of Enec.

"The commissioning phase of a nuclear energy plant is a critical step towards the first fuel load," said Mr Al Hammadi. "Before loading the fuel it is essential that the plant is tested under the highest standards of safety, security and quality."

Other tests to verify that the reactor coolant system and other associated systems met the Federal Authority for Nuclear Regulation's regulations were also successfully conducted.

"With the completion of these tests on Unit 1, we are moving closer to achieving our goal of supplying up to a quarter of our nation's electricity needs with low-carbon, sustainable nuclear energy," said Mr Al Hammadi. "Our work at Barakah continues to support the UAE's energy mix strategy as well as the future social and economic growth of the UAE."

The project at Barakah's Unit 1 is now 88 per cent complete, Unit 2 is 72 per cent complete, Unit 3 is 50 per cent complete and Unit 4 is 31 per cent complete. When fully operational, the four reactors are expected to supply about 25 per cent of the country's electricity by 2020.

## 阿联酋核电站通过安全测试

阿布扎比酋长国//安全测试在西部地区的巴拉卡核电站开展。

阿联酋核能公司在 Al Gharbia 的核电站开展了一项结构完整性测试以及整体泄漏率，过程持续了数周时间。

阿联酋核能公司的总经理 Mohamed Al Hammadi 说，这些测试验证了结构强度以及核电站极端情况下安全运行的能力。

"核电站的试运行阶段是第一次载料的关键步骤，" Al Hammadi 说道，"在装载燃料之前，有必要让核电站在安全、保障、品质的最高标准下测试。"

其他满足联邦核管制局要求的核实反应堆冷却系统和相关系统的测试也成功开展。

"Unit 1 测试完成，我们将向完成低碳、可持续核能供应国家四分之一电力需求的目标更近。" Al Hammadi 先生说，"我们在巴拉卡的工作将继续支持阿联酋的能源混合策略以及阿联酋未来的社会经济增长。"

巴拉卡 1、2、3、4 号机组目前分别完成了 88%、50%、72%、31%。2020 年全部完成时，四个反应堆有望供应国家 25%的电力。

# UK's nuclear clean-up cost estimate dips to $154 billion

The cost of cleaning up the UK's historic nuclear sites has decreased slightly from last year's estimate, the Nuclear Decommissioning Authority (NDA) said in its Nuclear Provision corporate report, which it published on 13 July. Nuclear Provision is the best estimate of how much it will cost to clean up 17 of the country's earliest nuclear sites over a program lasting around 120 years.

The estimate is based on the expected costs of decommissioning, dismantling and demolishing the buildings, managing and disposing of all waste, and remediation of land. The Nuclear Provision also includes the costs of running more modern plants that are still operational, in particular Sellafield's reprocessing facilities.

The estimate now stands at around £117 billion ($154 billion) spread across the next 120 years, which is down slightly from last year's estimate of £118 billion.

"Decommissioning many of these facilities will continue well into the 22nd century. Over this timescale, plans and forecasts will be affected by technology improvements, changes in government policy, economic circumstances and environmental issues," the NDA said. "The figure is updated annually but should be regarded as an informed estimate that depends on assumptions about future developments and lies within a range of possible figures," it added.

The NDA owns the historic sites on the government's behalf and is responsible for deciding how they should be decommissioned. Decommissioning work is carried out by Site Licence Companies, working for the NDA.

Costs are currently around £3 billion annually. Of this, about two-thirds is met by the government and the remainder from revenue earned through the NDA's commercial activities. This includes contracts with UK and overseas customers for the reprocessing and management of used nuclear fuels. At Sellafield, operational plants are forecast to generate about £10 billion of income between 2015 and 2027, the NDA says in the report.

Although the 2016 forecast is that future clean-up across the UK is broadly unchanged from the previous year's estimate, the NDA said forecasts for work that will be carried over the next century are inevitably uncertain. "It will be a number of years, for example, before many site programs resolve exactly how the work will be delivered and identify suitable technologies," it added.

In recognition of this uncertainty, the NDA publishes a range of estimates that could potentially be realistic. Based on the best data now available, different assumptions could produce figures somewhere between £95 billion and £219 billion, it said. Even these estimates will be subject to variation depending on emerging technological developments, as well as political changes and global economics, it added.

When publishing its accounts, the NDA is however required to provide a single figure and discounted to a 'today' value using rates laid down by HM Treasury and linked to government borrowing costs (adjusted for inflation). The latest rates, announced in December 2015, for the first time include a negative discount rate for expenditure more than ten years into the future. This results in a discounted provision of £161 billion.

The decommissioning mission is scheduled for completion in 2120, more than a century after the creation of the NDA.

"At sites where a decommissioning program is relatively straightforward and the challenges well understood, costs can be calculated with relative confidence and ultimately driven down," it said. "This is already happening at the sites of 11 Magnox nuclear power stations - first built during the 1950s to 1970s - as well as the former nuclear research sites at Dounreay, Harwell and Winfrith. At these sites, cost estimates are being reduced by billions of pounds and work accelerated."

But the NDA's largest site, Sellafield, "poses levels of complexity and uncertainty that are unique in the global nuclear sector", it said.

Regarding the costs for decommissioning other UK nuclear sites, the private-sector operator EDF Energy will fund decommissioning for the second generation of nuclear power stations, the Advanced Gas-Cooled Reactor (AGR) fleet. Funds for the future decommissioning program are set aside via the Nuclear Liabilities Fund.

"The next generation of nuclear power stations will be built by the private sector, with decommissioning plans and cost forecasts in place at the outset," the NDA said. "The latest generation of reactors are vastly more efficient than the early designs. They will produce far less waste and are expected to be cheaper to dismantle."

Annual report

The NDA has also recently published its annual report for 2015-2016, which states it has achieved more than £1 billion of commercial income of through contracts for reprocessing and management of used fuels, electricity generation at the Wylfa nuclear station and "ongoing asset disposal".

John Clarke, the NDA's chief executive and accounting officer, said in the annual report that the past year had brought a number of major developments for the authority, "but perhaps the most significant" were the UK Government's Spending Review, the publication of its latest long-term Strategy and the introduction of new management arrangements at Sellafield.

The Spending Review followed the election of the new UK government and applied to the entire public sector. Its stated aim is to safeguard investment in priority areas while taking difficult decisions to bring down the nation's debt.

Clark said: "The NDA secured a funding settlement that, while requiring us to strengthen our focus on improving the efficiency of our operations, also enables us to continue making progress across the estate. It is an acknowledgement that our mission is important to the UK and ensures we are able to maintain our commitment to our priority programs."

He added that, over the course of the year, the NDA has spent £3 billion in addressing the complex decommissioning tasks across the estate, and secured £1 billion in revenue to offset this cost.

"Working alongside our Parent Body Organisations, SLCs and suppliers, the driving strategic message for the years ahead is to deliver the same work for less cost where possible, to seek better ways of doing things and to do better things (improving efficiency and effectiveness), while always keeping sites safe and secure," he said.

# 英国的核清理成本预计下降到 1540 亿美元

清理英国历史核电设施的成本已经比去年的估计量略有下降，英国核能除役署（NDA）在其核供应企业提供的报告中说道，并于 7 月 13 日公布。核供应是估计清理全国 17 处最早核电设施费用的最好方式，这些核电设备持续工作约 120 年。

估价目前已达 1170 亿欧元左右（1540 亿美元），跨越今后 120 年，这比去年估价 1180 亿欧元略有下降。

“停运很多这样的设施，将持续到 22 世纪。在这段时间表里，计划和预测将会受到技术进步、政府政策变化、经济环境和环境问题的影响，” NDA 说。“这个数字每年更新一次，但是应看作是一个位置的估计，它取决于对未来发展的假设，处于各种可能的数额之间”，它补充说。

NDA 拥有政府代表的历史位置，对它们应该如何停运的决定负责。停运工作由具有网站牌照的公司进行，这些公司为 NDA 工作。

目前的费用约为 30 亿欧元每年。其中，约三分之二是由政府财政支出，剩下的是由 NDA 商业活动所得的收入中支出。这包括英国与使用核燃料深加工和管理的海外客户之间的合同。在塞拉菲尔德，运营工厂预计将在 2015 年和 2027 之间产生约 100 亿欧元的收入， NDA 在报告中说。

虽然 2016 年的预测是，未来英国各地的清理将与去年的估计大致不变，NDA 说，预测工作在下一个世纪仍将进行的必然性是不确定的。“这将是数年，例如，在很多网站方案正确解决这项工作究竟如何被传递，确定适宜的技术之前，” 它补充说。

认识到这个不确定性，NDA 出版了一系列可能现实的估计。根据现有最好的数据，不同的假设可能会产生 950 亿欧元到 2190 亿欧元之间的数字，它说。即使这些估计会受到基于新兴技术发展、政治变化和全球经济变化带来的影响，它补充说。

该估计是基于预期停运、拆除和拆除建筑物、管理和所有废物处置、土地整治的成本。核供应还包括运行仍在运营的更现代化的工厂的成本，特别是塞拉菲尔德的后处理设施的成本。

当发布其账目时，NDA 无论如何需要提供一个单一的数字，并使用一个贴现率对该数字贴现，这个贴现率由财政部制定，并与政府的借贷成本（扣除通胀因素）关联。最新的利率，在 2015 年 12 月宣布，首次包括由未来十余年后的开支产生的负面贴现率。这将导致 1610 亿欧元的折扣条款。

“在站点，停运程序是相对简单的，挑战被充分理解，成本可以相对放心地计算，并最终带动下来，”

它说。“这是正在 11 镁诺克斯核电站发生的事情——初建于 20 世纪 50 年代到 20 世纪 70 年代——前面的核点研究中的敦雷电站，哈威尔电站和 Winfrith 电站，这些电站的成本估算正随着工作的加速，在以数十亿英镑的数量减少”。

但是，NDA 最大的站点，塞拉菲尔德，“提出了在全球核领域内独特的复杂性和不确定性水平”，它说。

至于停运英国其他核电设施的成本，私营运营商 EDF 能源将资助停运的第二代核电站，改进型气冷反应堆（AGR）舰队。未来停运计划的资金将通过核负债基金拨出。

“核电站的下一代将由私营部门建造，将以停运计划和成本预测为出发点”，NDA 说。“最新一代反应堆比早期的设计极其更加有效，它们会产生少得多的废物，预计拆除费用也将更便宜”。

年报

克拉克说：“NDA 担保的资金结算，虽然要求我们加强我们专注于提高我们的运营效率，也使我们能够继续进行整个资产的进步。这是一个承认我们的使命对英国是重要的表现，并确保我们能够保持我们的优先方案的承诺”。

他补充说，在这一年的过程中，NDA 在解决整个复杂的核电站停运任务上花费 30 亿欧元，并保证用户 10 亿欧元的收入来抵消这一成本。

“与我们的 Parent Body Organisations、小额贷款公司和供应商合作，为未来几年的战略信息推动提供了相同工作而更低成本的可能情况，以寻求更好的做事方法和做更好的事情（提高效率和效益），同时始终保持核电站的安全可靠，”他说。

停运任务计划在 2120 年完成，超过创建 NDA 后的一个世纪。

NDA 最近也出版了 2015—2016 年的年度报告，其中指出它已经获得了超多 10 亿欧元的广告收入，这些收入是通过在 Wylfa 核电站使用燃料、发电的再处理和管理，及“正在进行的资产处理”中获得的。

约翰•克拉克，NDA 的首席执行官和财务官，在年度报告中指出，过去的一年带来了当局许多的主要发展，“但也许最显著的”是英国政府的开支审查，其最新出版的刊物，包括它长期的战略和在塞拉菲尔德新管理安排的介绍。

开支审查沿袭了英国新政府的选举，适用于整个公共部门。它声称其目标是保障优先领域的投资，同时采取艰难的决定，以降低该国的债务。

# China moves closer to “emissions plateau”

Decline in China’s coal demand steepens as economy shifts from heavy industry towards services, according to new official data

China’s demand for fossil fuels, most notably coal, fell sharply in the first six months of this year, further evidence that moves to curb overcapacity and battle pollution are pushing China towards a much-vaunted peak in carbon emissions.

Data from China’s National Bureau of Statistics (NBS), the country’s top statistics agency, have long been closely-watched by those trying to work out whether China's carbon emissions are about to level off.

This is even more the case in the first year of China’s 13th Five Year Plan, which runs from 2016 to 2020 and aims at “greener growth”.

However it is still far too early to tell whether the world’s largest source of greenhouse gases can engineer a steep long-term decline after hitting an emissions peak expected within the next decade.

The NBS data released today showed that coal output fell almost 10% from January to June, compared with the equivalent period in 2015, and a much faster fall compared with the first six months of last year.

Earlier this year, China's central government banned the construction of new mines and ordered the rapid closure of older collieries in a bid to rein in chronic overcapacity in the sector and put the country on a path to a peak in carbon emissions by 2030 or before.

Weaker coal output was reflected in the latest figures on the amount of electricity generated from fossil fuels blamed most for climate change.

NBS data showed that thermal power generation (including coal and gas-fired electricity) fell by 3.1% year-on-year in the first half of 2016, while hydro, nuclear, wind and solar power generation went up by 13.5%, 25%, 14% and 28% respectively.

Moreover, the figures have again highlighted one of the major contradictions in the country's climate and energy policy, as new coal-fired power capacity continues to get permits from provincial officials.

"China still has enough coal-fired projects in the pipeline to keep adding one coal-fired power plant per week until 2020, potentially resulting in a total of 400,000MW of excess capacity," said Lauri Myllyvirta, a campaigner with Greenpeace East Asia.

Preferential access to the grid for large coal-fired plants, most of which are owned by China's big five utilities, has long been blamed for crowding out wind, hydro and solar.

This has prompted central government to push for a fairer system so that China can increase the share of renewables in the energy mix, but so-called green dispatch is expected to be a slow, incremental process because of opposition from large power companies and the state grid.

Access for renewables actually worsened this year, prompting lawsuits from China's huge wind energy industry and complaints from provinces that account for most of the country's turbines.

Gas v renewables

Quite when China peaks its energy-related greenhouse gas emissions will depend to a large extent to which renewables, rather than gas, replace coal.

Natural gas accounts for around half of the carbon dioxide per unit of power generated compared with coal, and a huge increase in demand will offset some of the emissions savings from lower coal use, said Yang Fuqiang, senior adviser with the Natural Resource Defence Council.

"If the decline of coal this year can offset increased carbon emissions from the growth of natural gas and oil, we will be more confident to say that China has entered an emissions plateau," he said in response to the NBS figures.

China will triple its gas demand to 510 billion cubic metres (bcm) by 2030, rising to 710 bcm by 2050, the China National Petroleum Corporation said in a rare long term energy outlook published this week.

Meanwhile, Yang adds that a peak in coal use will require any rebound in heavy industry to be moderate, particularly in industries such as steel, metals, cement, materials and chemicals, which account for almost half of China's coal demand.

Structural shift

However the data released today does suggest structural changes in the Chinese economy, and decoupling energy demand from economic growth, are starting to take effect, one of the main intentions of the current FYP.

China's power consumption was up 2.7% year-on-year in the first six months of 2016, compared with overall economic growth of 6.7% during the same period.

Electricity consumption by the manufacturing sector rose by only 0.5%, said the NBS, reflecting large-scale shutdowns of inefficient and unneeded capacity.

By contrast, electricity consumption by service industries – which the 2016-2020 plan aims to encourage – was

up by 9.2%.

However, household electricity demand rose 7.7%, a figure that suggests China will have to do more in improving efficiency and the use of smart grids and meters to curb the impact of new gadgets and appliances.

Energy-hungry products such as refrigerators, air conditioners, cookers, tumble dryers and electronic gadgets have become increasingly affordable for China's middle class, and at a time of mass migration to its cities, which further stokes up demand for electric products. It should be said, though, that per capita electricity use in China is just a fifth of that in the US for example.

## 中国将迈入“碳排放平台期”

国家统计局最新数据表明，随着经济重心由重工业转移向服务业，中国煤炭需求急剧下滑。

今年上半年，中国化石能源需求，尤其是煤炭需求显著下降。这进一步证明，中国去除过剩产能和治理污染的措施将进一步推动其达到所宣传的碳排放峰值。

对于那些关注中国的碳排放量现在是否已经渐趋平稳这个问题的人来说，中国国家统计局的数据已经成为他们长期密切关注的对象。

今年是中国以“绿色增长”为核心的“十三五（2016-2020）”规划的开局之年，因而这一问题尤为重要。

但在未来十年内，这个世界上最大的温室气体排放国能否实现达峰之后继续推动碳排放长期加速下降？现在回答这个问题还为时过早。

今天中国国家统计局发布的数据显示，今年 1 至 6 月，原煤产量同比下降近 10%，下降速度明显高于去年同期。

今年年初，为了化解煤炭产业长期以来产能过剩的问题，确保在 2030 年或更早之前实现碳排放达峰，中国政府明令禁止新建煤矿，并加速关闭老旧煤矿。

近期，被称为气候变化罪魁祸首的化石燃料发电量呈下滑趋势，也反映出中国原煤产量的疲软。

中国国家统计局的数据显示，与上年同期相比，2016 年上半年火力发电量（包括燃煤、燃气发电）下降了 3.1%，而水力、核能、风能和太阳能发电量分别增长了 13.5%、25%、14%、28%。

然而，从各省仍然继续批建新的煤电项目来看，中国气候政策和能源政策之间的矛盾进一步凸显。

绿色和平东亚项目活动人士柳力（Lauri Myllyvirta）表示：“中国目前计划兴建的煤电项目数量庞大。在 2020 年之前，每周会有一座新的燃煤电厂建成，过剩产能总量可能达到 4 亿千瓦。”

此外，中国电网的输送和分配政策也饱受诟病。中国的大型燃煤电厂（大部分为五大发电集团资产）享有电网优先分配权，而风电、水电和太阳能电厂受到排挤。

增加可再生能源在能源结构中的比重，中央政府需要努力构建一个更为公平的“绿色调度”体系，但考虑到来自大型发电集团和国家电网公司的阻力，估计这是一个十分缓慢的渐进过程。

实际上，今年中国可再生能源的份额呈现下降趋势，不仅导致风能产业提起多起诉讼，也引起大力发展风电产业的省份的不满。

关键不在于天然气而在于可再生能源

中国能源行业能够多快达到温室气体排放峰值，取决于可再生能源，而不是天然气，在多大程度上可以取代煤炭。

自然资源保护协会高级顾问杨富强表示，天然气单位发电量的二氧化碳排放是燃煤发电的一半左右。若大规模使用天然气，其排放的二氧化碳量仍会部分抵消之前我们为减少燃煤所做的努力。

杨富强在就中国国家统计局发布的数据作出回应时说：“如果今年因为煤炭消费减少而降低的碳排放与天然气和石油消费增长而增加的碳排放能相互抵消的话，那么我们会更加相信中国已经进入了碳排放平台期。”

中石油经济技术研究院本周发布的最新研究报告《2050 年世界与中国能源展望》称，到 2030 年，中国天然气需求会是现有水平的三倍，达到 5100 亿立方米，到 2050 年将增加到 7100 亿立方米。

同时，杨富强表示，为确保煤炭消费达到峰值，就需要重工业，特别是占据中国煤炭需求一半份额的钢铁、五金、水泥、材料和化学等行业的任何回弹保持适度。

结构转型

但是，今天国家统计局发布的数据确实显示，中国经济结构转型已经初具成效，能源需求也与经济增长脱钩（现行“十三五”规划的主要任务之一）。

与上年同期相比，今年上半年中国的用电量增长了 2.7%，而上半年经济增速达到了 6.7%。

国家统计局的数据表明制造业用电量只增长了 0.5%。这说明一大批低效多余的工厂被关闭了。

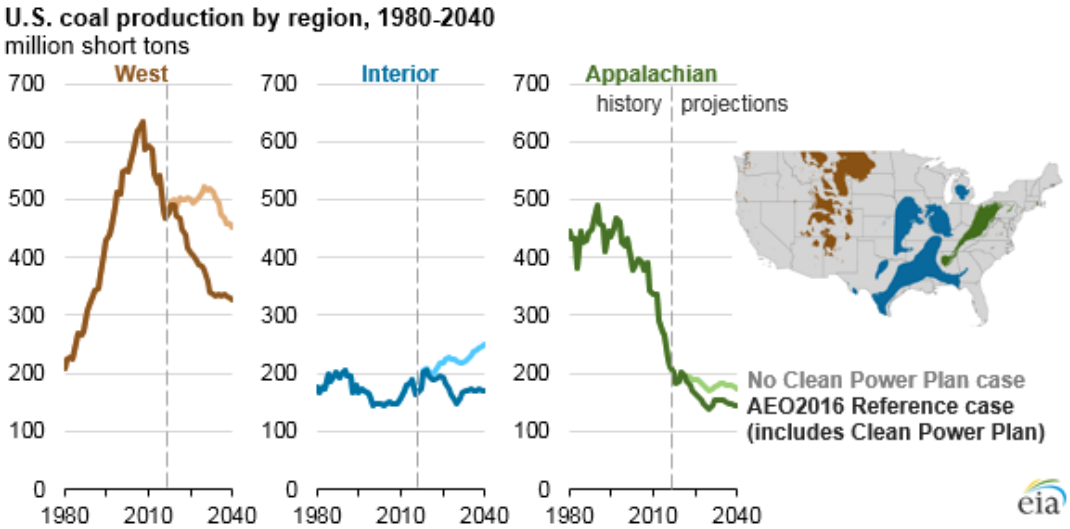
另一方面，“十三五”规划中着力发展的服务业的用电量上升了 9.2%。

然而，家庭用电需求也增长了 7.7%，这表明中国还需提高能效，推广智能电网及智能电表的使用，从而控制新家用电器用电需求对电网的影响。

尽管中国的人均用电量仅为美国的五分之一，但是现在中国的情况仍不容乐观。一方面，中国的中产阶级越来越消费得起冰箱、空调、炊具、滚筒干衣机、数码产品等高能耗产品；另一方面，农村人口大规模向城市迁移，这将带来电器需求的激增。

# *Coal（煤炭）*

## Clean Power Plan reduces projected coal production in all major U.S. supply regions




Source: EIA, Annual Energy Outlook 2016

U.S. coal production is projected to decline by about 26%, or 230 million tons, between 2015 and 2040 in EIA's Annual Energy Outlook 2016 (AEO2016) Reference case, which assumes the implementation of the Clean Power Plan (CPP). In a scenario that assumes the CPP is never implemented (No CPP case), U.S. coal production remains close to 2015 levels through 2040. Although production in each major U.S. coal supply region is expected to decline when the CPP is implemented, the magnitude of the effects differs because of differences in coal quality,

pricing, and the markets served by each region.

In 2015, the coal production shares of the West, Interior, and Appalachian regions were 55%, 19%, and 26%, respectively. In the scenario without the Clean Power Plan, these shares were expected to shift to 52%, 29%, and 20% by 2040, respectively, as coal production from the Interior region increases while coal production in the West and Appalachian regions decreases. In the Reference case, the decline in coal demand impedes growth for the Interior region and leads to even larger declines in the West and Appalachian regions. By 2040, market shares for the West, Interior, and Appalachian regions are 51%, 26%, 22%, respectively.

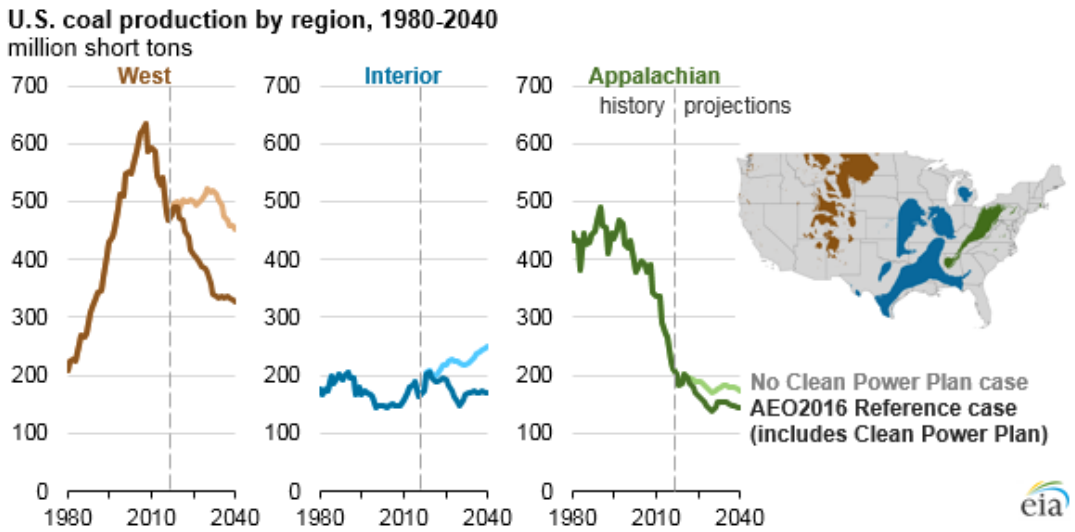
West. Coal production in the West region falls by 155 million tons between 2015 and 2040 in the Reference case, compared to a reduction of 31 million tons in the No CPP case. Approximately two-thirds of Western coal production occurs in the Powder River Basin, where relatively low mining costs and low-sulfur coal have offset higher transportation costs and allowed western coal to remain economic in distant markets.

However, the addition of sulfur control equipment at existing coal-fired power plants to accommodate the Mercury and Air Toxics Standards (MATS) early in the projection period makes higher sulfur coals more competitive at units that had previously used low-sulfur coal to comply with prior limitations on sulfur dioxide emissions. In the Reference case, competition from natural gas and renewables combined with coal-fired power plant retirements also lowers coal demand in the states that are currently large consumers of Western coal.

Interior. Coal production in the Interior region increases by 86 million tons by 2040 in the No CPP case. In the Reference case, this increase is smaller, totaling 5 million tons by 2040. Over the projection period, coal producers in the region are projected to control costs using longwall mining, a technique that is well-suited for the region's coal reserves. Additionally, the installation of sulfur control equipment at existing coal-fired power plants will enable Interior coal to displace some use of lower-sulfur Western and Appalachian coals.

Appalachian. Coal production in the Appalachian region, which has declined steeply over 2000-2015, is projected to see the smallest reduction in production attributable to the CPP. In the No CPP case, Appalachian coal declines 50 million tons by 2040. In the Reference case, Appalachian coal declines 79 million tons. Appalachian steam coal production is relatively expensive relative to other coals, and it is expected to experience decreasing labor productivity. This lower productivity further decreases its competitiveness with coal from other regions, as well as with other fuels used to generate electricity, such as natural gas. However, production of metallurgical coal, which is used in the steelmaking process, represented about 28% of the region's total coal production in 2014 and is not affected directly by the CPP. However, slower growth in international metallurgical coal demand and falling international steam coal trade also limit projected export growth for Appalachian coal.

## 清洁能源计划减少美国所有主要供应地区煤炭生产预测



资料来源：环境影响评价，2016 年度能源展望

2015 年至 2040 年，引用 2016 年环评的年度能源展望(AEO2016)数据，如果执行清洁能源计划(CPP)，美国煤炭产量预计将下降约 26%，即 2.3 亿吨。假设 CPP 从来没有实现（没有这个项目），2040 年的美国煤炭生产量仍接近 2015 年的水平。尽管在每个主要生产美国煤炭供应地区 CPP 下降，因为煤炭质量、定价和每个地区的市场服务不同，影响的大小不同。

2015 年，煤炭生产的西方，内部，阿巴拉契亚地区分别是 55%，19%，和 26%。到 2040 年，在该方案中没有清洁能源计划，这些股票将转移至 52%，29%和 20%，西部和阿巴拉契亚地区的煤炭产量减少，而内陆地区煤炭产量增加。在参考案例中，煤炭需求下降阻碍内陆地区发展，导致西部和阿巴拉契亚地区的下降。西部，内部,和阿巴拉契亚地区的市场份额分别是 51%,26%,22%。

西部。2015 年到 2040 年期间，根据参考资料，西部地区煤炭生产下降 1.55 亿吨，相比减少 3100 万吨的 CPP 的情况。大约三分之二的煤炭在河盆地西部矿业生产，成本相对较低而且低硫煤可以抵消较高的运输成本， 在较远区域的市场，西部煤炭的价格比较经济。

然而，在现有燃煤电厂增添硫控制设备，以适应汞和空气毒物标准(垫)的投影，限制二氧化硫排放之前，早期高硫煤更有竞争力。参考数据中，目前西方煤炭的消费大国美国天然气和可再生能源发展加上火力发电厂也降低了煤炭需求。

内部。CPP 没有出现时，截至 2040 年，内陆地区的煤炭产量增加 8600 万吨。在参照情况下，增长较少，到 2040 年达 500 万吨。在预测期间，该地区的煤炭生产商预计将使用长壁开采控制成本，这种技术非常适合该地区的煤炭储量的状况。此外，在现有燃煤电厂，安装硫控制设备将使室内煤取代一些西方和阿巴拉契亚低硫煤的使用。

阿巴拉契亚山脉。阿巴拉契亚地区的煤炭生产在 2000 - 2015 年急剧下降，由于 CPP，预计最小的减少生产。在没有 CPP 的情况下，阿巴拉契亚煤下降到 5000 万吨。在参考的情况下，阿巴拉契亚煤下降 7900 万吨。相对于其他煤，阿巴拉契亚蒸汽煤炭生产相对贵，预计将会降低劳动生产率。这种低效率进一步降低其竞争力，以及与其他燃料用于发电、天然气等。然而，将炼焦煤的生产用于炼钢过程，2014 年约占该地区煤炭生产总量的 28%，而不是直接受 CPP 的影响。然而，国际炼焦煤需求增长放缓，国际动力煤贸易下降也会限制阿巴拉契亚煤炭出口增长。

# China's June coal output falls 17% on year to 277.54 million mt

China mined 277.54 million mt of crude coal in June, down 16.6% on year, according to figures released by the National Bureau of Statistics on Friday. In the first six months, China mined a total of 1,627.64 million mt of crude coal, down 9.7% on year.

The fall was not surprising following the implementation of the 276-workday policy since late April, according to Mao Xiaoling, an analyst with Beijing-based Dexin Yongming Consultation.

China has plans to keep its annual coal consumption under 4.1 billion mt by the end of 2020, Mao said, adding that coal would account for less than 58% of the country's national energy consumption by then.

In June, China generated 490.8 billion kWh of electricity, up 2.1% on year.

Of that, coal-fired power represented 345.7 billion kWh, up 0.6% on year; hydropower accounted for 106.5 billion kWh, up 3.5% on year; nuclear power accounted for 18 billion kWh, up 13.4% on year.

# 中国六月煤炭产出同比下降 17％至 2.7754 亿吨

据周五国家统计局公布的数字显示，中国六月开采 2.27754 亿吨原煤，同比下降 16.6%。前 6 个月，中国共开采原煤 16.2764 亿吨，同比下降 9.7％。

产量下降并不意外，自 4 月下旬以来，实施了 276 个工作日的政策，根据北京的德信永明咨询分析师毛晓玲的信息。

中国计划到 2020 年底，保持年耗煤量在 41 亿吨以下，毛晓玲补充说，当时煤炭将占全国能源消费的比例不到 58％。

6 月，中国生产 4908 亿度电，同比增长 2.1％。

如此，燃煤发电量为 3457 亿千瓦时，同比增长 0.6％；水电占 1065 亿千瓦时，同比增长 3.5％；核电占 180 亿千瓦时，同比增长 13.4％。

# Moody's: Poland to remain dependent on coal

Poland needs to advance a low-carbon economy to meet European Union requirements.

The economy in Poland is likely to remain driven by coal power with few changes in the energy mix expected before the end of the decade, a ratings agency said.

"Moody's notes that the existing framework provides little support for generators, with no major changes expected before 2021," the ratings agency said in a country profile.

In June, the European Commission offered more than $150 million in grants to support the development of energy infrastructure projects in Central and Southeastern Europe. With few tapped reserves of its own, Poland imports most of its oil and natural gas from Russia.

Moody's Investors Service said from London that utility companies in Poland are less diverse than their European counterparts, though their credit profiles remain in good shape. Cash flows in an era of lower energy prices, however, means diversification may be cost prohibitive.

"Moody's notes the Polish power sector's high dependence on coal presents a challenge in the context of the European Union's decarbonization policies," it said. "The sector also faces regulatory uncertainty as draft legislation for a capacity market has yet to be designed, while the impact of new laws on renewable energy sources and investments in wind farms remains unclear."

Poland gets most of its electricity from coal, but needs to have 15 percent of its power from renewable energy by 2020 to meet European Union requirements. Wind energy and natural gas could help with low-carbon objectives.

Poland's Geological Institute published a report four years ago concluding the country's recoverable gas reserves may be up to 67 trillion cubic feet. The report estimated that level could satisfy domestic demand for 35 to 65 years.

# 波兰仍然依赖于煤炭

波兰需要推进低碳经济才能满足欧盟的要求。

在这个十年结束前，在预计的能源结构中，波兰的经济很有可能是由煤炭电力来推动的，不会发生什么变化，一家评级机构表示。

“穆迪公司指出，现有的框架并没有为电力公司提供任何支持，在 2021 年之前不会发生重大的改变，”该评级机构在一篇国家概况中表示。

在 6 月，欧洲委员会提供了超过 1.5 亿美元的赔款，用以支持中欧和东南欧的能源基础设施项目的开发。完全没有开发自己的储量，波兰大部分石油和天然气都是从俄罗斯进口的。

穆迪投资者服务公司在伦敦表示，波兰的公用事业公司与他们的欧洲同行相比比较单一，尽管如此他们的信用状况维持良好。然而，在较低的能源价格的时代，现金的流动意味着多样化可能会花费巨额成本。

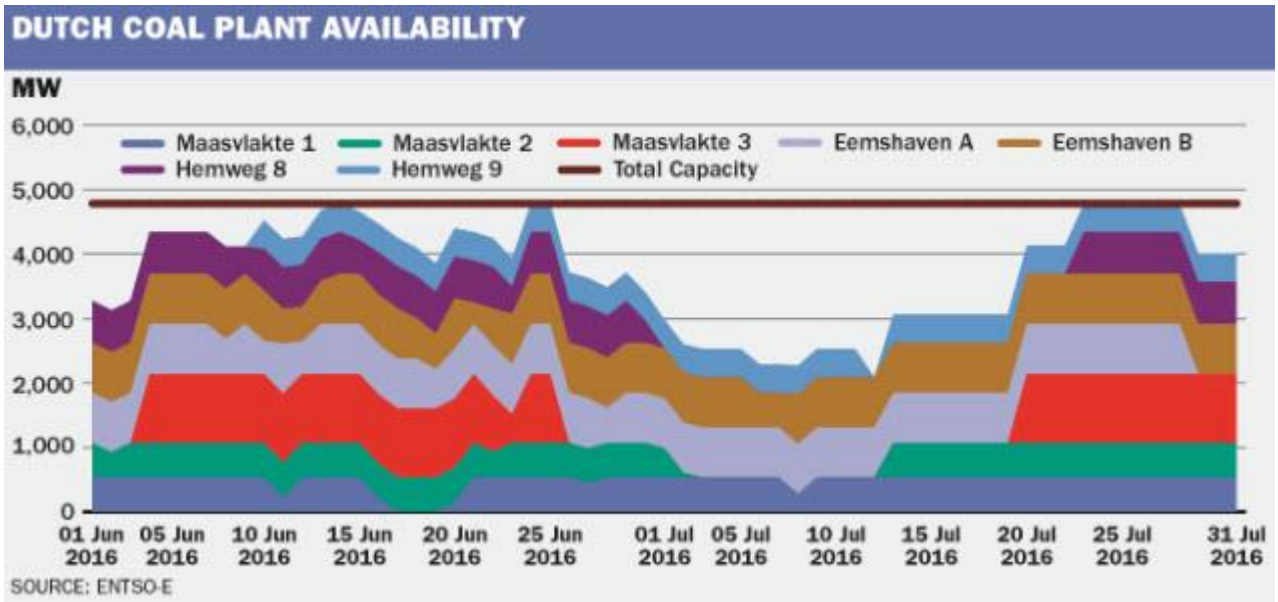
“穆迪公司指出，波兰电力行业对煤炭的高度依赖在欧盟脱碳政策的背景下成为了一个挑战，”它表示。“该部门还面临着监管的不确定性，因为用于市场容量的立法草案尚未起草，同时关于新的法律对于可再生能源以及在风电场方面的投资的影响尚不清楚。”

波兰大部分电力来自于煤炭，但是，该国需要在 2020 以前通过可再生能源获得其 15%的电力才能满足欧盟的要求。风能和天然气可以帮助达到低碳的目标。

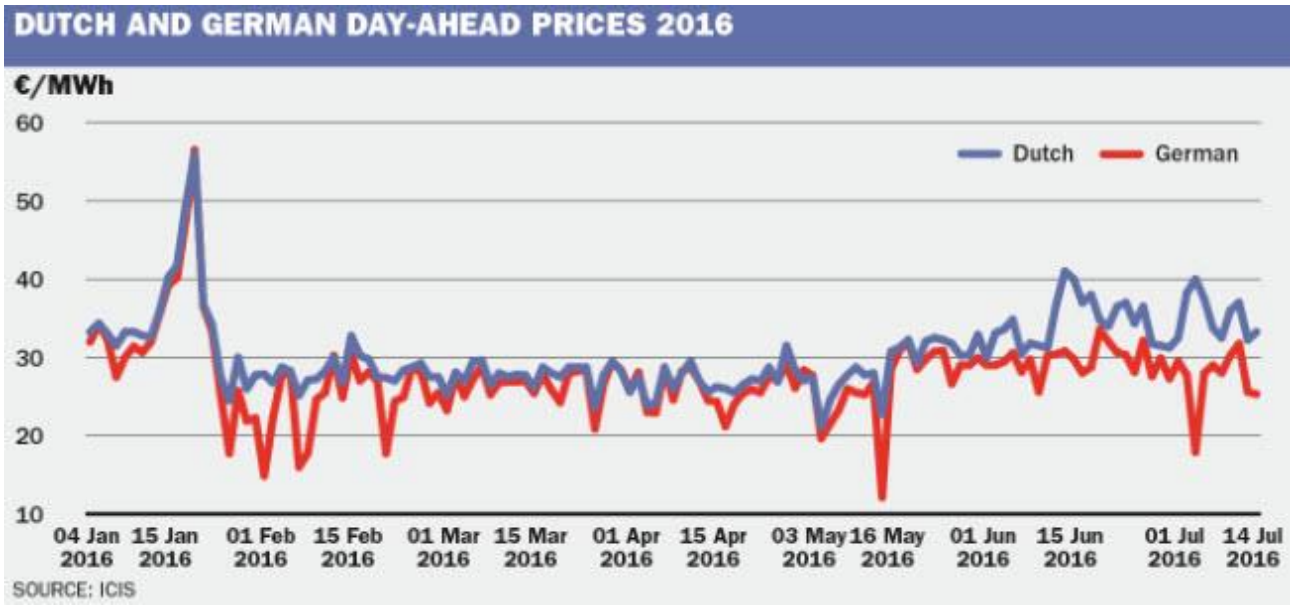
波兰的地质研究所在四年前发表了一份报告总结称，该国的可采天然气储量可能高达 67 万亿立方英尺。该报告估计此水平可能会满足该国 35-65 年的国内需求。

# Coal outages drive Dutch day-ahead power premium to Germany

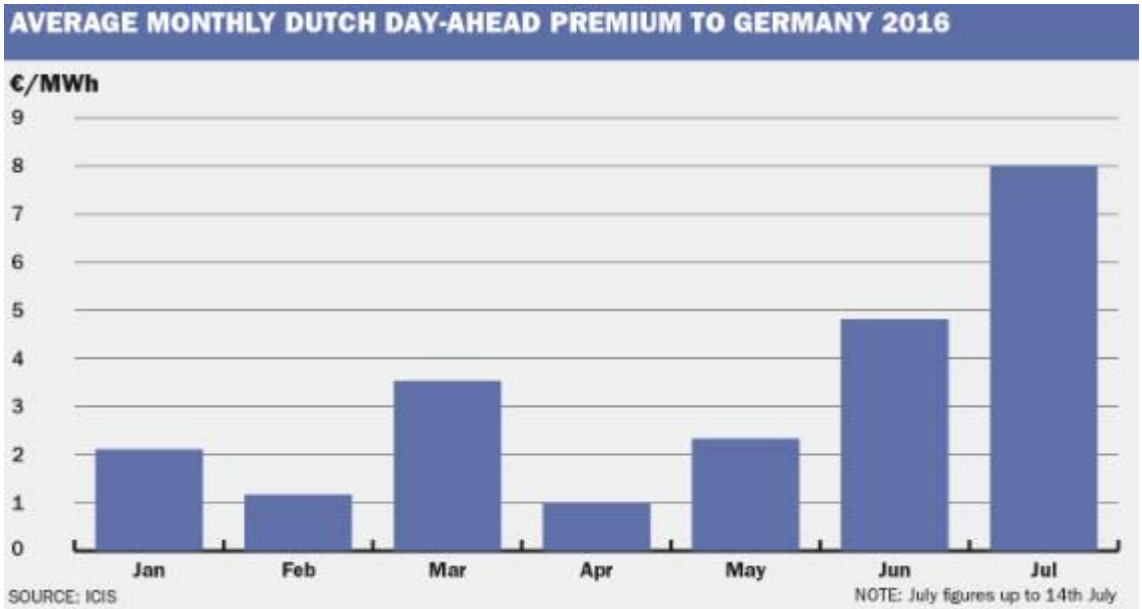
A Dutch premium to Germany on the day-ahead electricity market has increased since June, driven by coal plant outages in the Netherlands. But with coal plant availability set to improve, the spread should begin to narrow again, traders said.




The Netherlands normally holds a price premium to Germany on the over-the-counter (OTC) day-ahead market, owing to a high quantity of renewables in Germany. This discount had been relatively modest during the first five months of the year, with Dutch Day-ahead Baseload carrying an average premium of between €1.00/MWh and €3.50/MWh in each month.




However, the average premium increased to almost €5.00/MWh in June, and has continued to grow in July, averaging €8.00/MWh in the first half of the month.




The primary reason for the increasing premium has been strength in Dutch day-ahead prices since the start of June driven by poor coal plant availability.

"The Netherlands has a lot of outages. It's missing a lot of coal," one trader said.

The country's largest coal plants, Maasvlakte, Eemshaven and Hemweg, have all experienced some scheduled or unscheduled maintenance over the past six weeks, which has cut supply.

In the first two weeks of July, the combined available capacity of the three plants ranged from 47% to 64% of the total.

Electricity production from coal has become increasingly important to the Dutch market in recent years, growing by 35% in 2015 to reach the highest level of production since 1990, according the national statistics office CBS.

With gas-fired production in decline, coal could even overtake natural gas as the dominant production fuel if the

trend from 2015 is seen again this year (see EDEM 28 June 2016).

Given the importance of coal to the Dutch generation mix, the outages in June and July helped increase Dutch day-ahead prices, expanding the premium to the German market.

Other factors

Although coal unavailability has been the main price driver in recent weeks, relatively poor renewable generation in the Netherlands has also contributed to higher prices.

Dutch day-ahead values have also been influenced by a slight increase in prices at the TTF natural gas hub. The TTF has long been a price driver for the Dutch curve due to the fact that gas is the marginal fuel in the country (see EDEM 27 April 2016), but the TTF is not normally a significant driver of day-ahead prices. However, with coal outages necessitating an increase in gas-fired production to fill the shortfall, the TTF has had a small impact over the past month.

"You need to take TTF into account, especially when coal comes off," one power trader said.

TTF prices were pushed up in June and July by planned and unplanned maintenance in Belgium, which has helped to increase Dutch day-ahead power prices.

Outlook

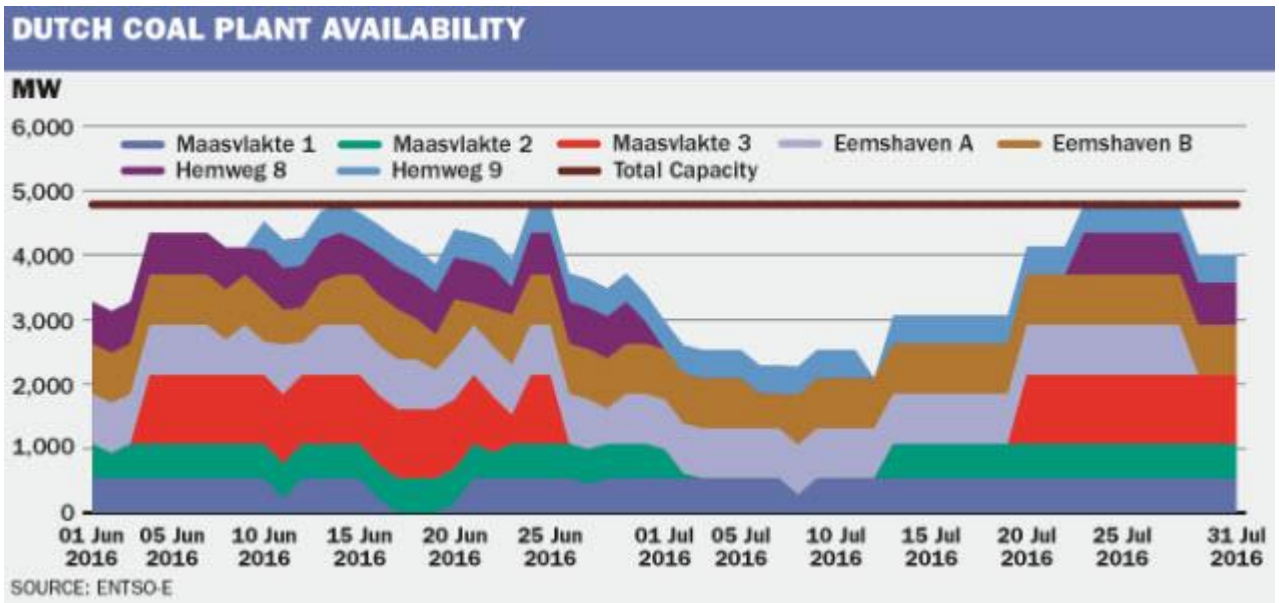
On Thursday, the Dutch power Week 29 contract climbed to the highest value for a front week contract so far this year, suggesting that prices are unlikely to drop in the short term. This was driven primarily by forecasts for hotter weather in France, combined with relatively poor nuclear availability, traders said.

However, with coal plant availability in the Netherlands set to improve by the end of Week 29 according to ENTSO-E data, Dutch prompt prices could begin to fall.

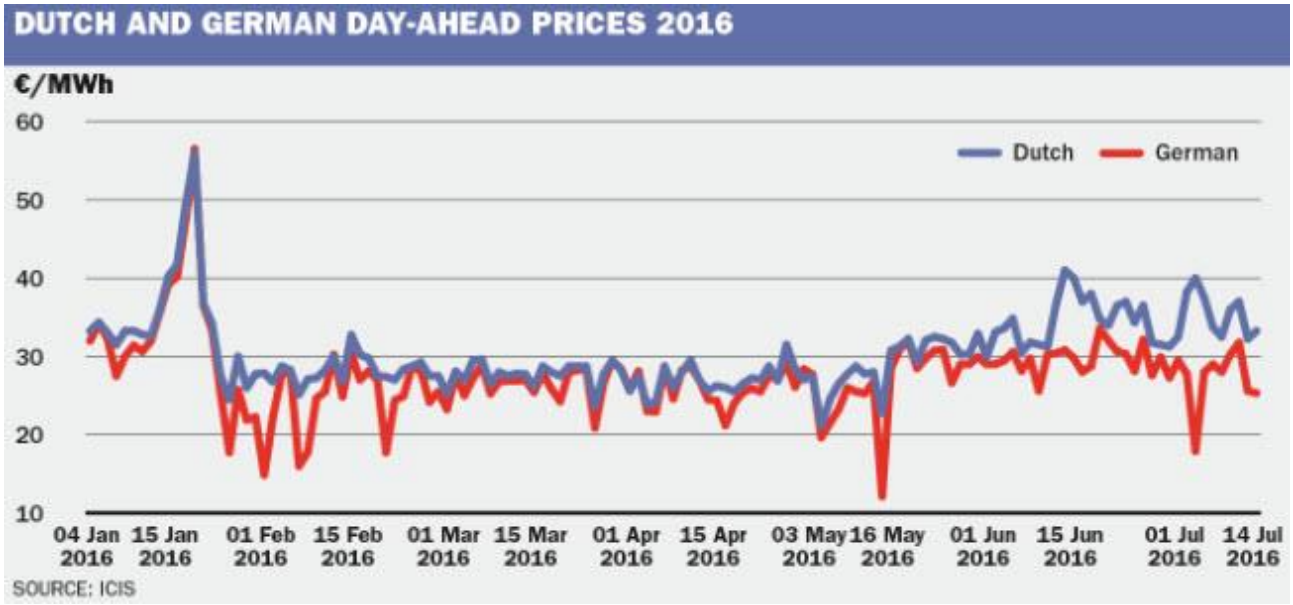
"When the coal comes back online, Dutch prices will come back down and the spread to Germany will narrow," a trader said. matthew.jones@icis.com

## 煤炭停产导致荷兰日前电力相对于德国溢价

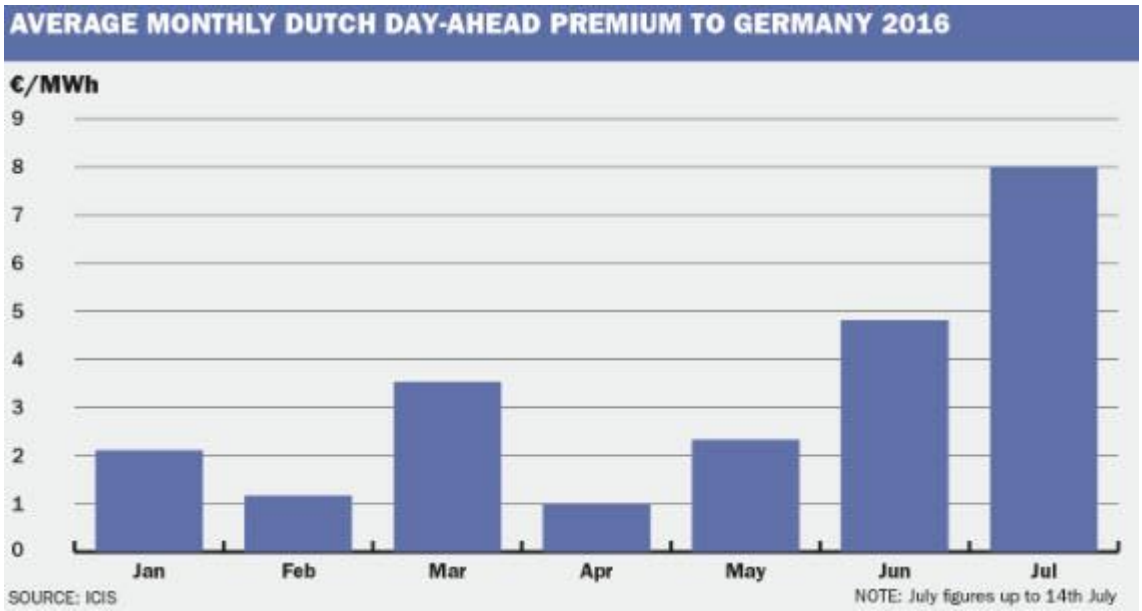
由于荷兰煤电厂的停运，荷兰对于德国有关日前电力市场的溢价自 6 月以来已经有所增加。但是，随着可用煤炭厂预计进行改进，该价差可能会再次缩小，交易商表示。



荷兰通常在柜台交易（OTC）的目前市场方面对于德国都具有一个溢价，这是由于德国具有大量的可再生能源。这个贴现在今年头五个月内一直相对比较适度，荷兰日前基底负荷每年具有 1.00 欧元/MWh 到 3.50 欧元/MWh 的平均溢价。




然而，平均溢价在六月增加至 5.00 欧元/MWh，并且在七月已经持续增长，在该月头半个月平均为 8.00 欧元/MWh。




造成溢价增加的主要原因在于自六月初以来，荷兰日前价格由于受到煤炭工厂较差可用性的推动而所有增强。

“荷兰许多煤炭电厂停运。其损失了大量的煤炭，”一位交易商称。

该国最大的煤电厂——马斯弗拉克特、埃姆斯哈文以及 Hemweg——都在过去的六周内经历了定期或不定期的维护，目前在于削减供应。

在七月的头两周内，这三个工厂合并的可用容量占到了总量的 47%到 64%。

煤炭的电力生产在近几年对于荷兰市场越来越重要，在 2015 年增长了 35%，达到了自 1990 年以来的最高生产水平，据国家统计局 CBS 显示。

随着燃气产量的下降，如果 2015 年的趋势在今年再次出现，那么煤炭甚至有可能会超过天然气成为主要的生产燃料（见 EDEM，2016 年 6 月 28 日）。

鉴于煤炭对于荷兰发电结构的重要性，六、七月份的停运有助于增加荷兰日前价格，扩大相对于德国市场的溢价。

其他因素

虽然煤炭的不可用性一直是最近几周的主要价格推动因素，但是荷兰相对较差的可再生能源发电量也促成了更高的价格。

荷兰日前值也一直受到 TTF 天然气枢纽价格的小幅上调的影响。该 TTF 一直都是荷兰曲线的一个价格推动因素，因为天然气是该国的边际燃料这一事实（见 EDEM，2016 年 4 月 27 日），但是 TTF 通常不会是日前价格的重要推动因素。然而，随着煤炭停运迫使燃气产量增加来填补亏空，TTF 在过去的一个月已经产生了微弱的影响。

“你需要将 TTF 考虑在内，特别是当煤炭停用时，”一位电力交易商表示。

TTF 价格在六月和七月由于比利时计划内和计划外的维护而被推高，这有助于提高荷兰日前的电力价格。

展望

周四，荷兰电力 29 周合约攀升至今年最高的前一周合约的值，这表示价格不太可能在短期内下跌。这主要是受到了有关法国较热天气的预测的推动，再加上相对较差的核可用性，交易商表示。

然而，据 ENTSO-E 数据显示，荷兰燃烧电厂的可用性预计会在 29 周结束前有所改善，荷兰的即时价格可能会开始下跌。

“当煤炭恢复上线，荷兰价格会回落，并且相对于德国的价差将会缩小，”一位交易商表示。

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# Short View：Why coal is back in black

If dogs are man’s best friend, that might explain the market’s affection for coal, one of the poorest commodity performers in recent years. That is until this year. Thermal coal prices are up about a fifth from this spring’s low.

Great news for long-suffering holders of coal mining shares, though some will rightly wonder if the run can last. Coal has probably caught up with other energy commodities.

Oil has of course led the way; over the long run coal prices tend to track crude. Yet coal’s main energy competitor is natural gas for power generation. In the US the Henry Hub benchmark price has leapt 30 per cent in the past month alone, partly due to unseasonably warm weather.

Coal is now cheaper in the US, on an energy equivalent basis, than natural gas.

Consol Energy of the US, which produces both coal and natural gas, wins either way. Its shares have doubled this year. Fuel switching back to coal from gas (at power plants) could hurt gas demand and prices. If so, coal most probably would follow it down.

In Europe, carbon taxes on coal keep natural gas competitive. The tax also makes it harder for electric utilities to make money on the spread between coal and power prices. German utilities have struggled to make money given their exposure to coal when renewables account for more than a third of the country’s electricity generation.

RWE, one of Germany’s two biggest power companies, still depends on coal for 56 per cent of its generation. No surprise that its shares are up more than a quarter since mid-April. Whether RWE can pass on its higher coal costs to its customers is not so clear.

Events in China, the world’s largest producer, probably made the biggest difference to prices. With miners there

producing at a loss, Beijing has forced production cutbacks, especially from China Shenhua, the world's largest coal miner. These cuts could equal 13 per cent of China's output if fully implemented — more than all of Russia's coal production. Macquarie, though, thinks it will probably be significantly less.

China's excess capacity on coal, as with steel, will not disappear so easily. Unless oil prices can surge higher, the warmer feelings towards coal will soon cool.

## 短线视点：煤炭价格迎来春天？

动力煤价格从今春的低点上涨了约五分之一，但投资者有理由怀疑这种势头能否持续。

如果说狗是人类最好的朋友，或许也可以说煤炭是市场最好的朋友。煤炭是近年来表现最差的大宗商品之一，但今年不同了。动力煤价格从今春的低点上涨了约五分之一。

这对于长期忍痛持有煤矿股的投资者来说是重大利好消息，尽管一些人也有理由怀疑这种势头能否持续。煤炭可能已经追上了其他能源类大宗商品。

当然，石油一直是领头者；长远来看，煤炭价格倾向于追踪原油走势。然而，煤炭的主要能源竞争对手是用于发电的天然气。在美国，一定程度上由于气温高得反常，Henry Hub 天然气基准价格仅在过去一个月就跃升了 30%。

在美国，以能量等效算，煤炭如今比天然气更便宜。

既产煤又产天然气的美国康寿能源(Consol Energy)两头受益。该公司股价今年已经翻了一倍。（电厂）将所用燃料从天然气切换回煤炭可能伤及天然气的需求和价格。要是这样的话，煤炭价格很可能会随之下滑。

在欧洲，对煤炭征收的碳税使得天然气仍有竞争力。碳税也使得电力公司更难以依靠煤价与电价之间的差价赚取利润。由于大量使用煤炭发电，德国公用事业企业已经很难赚钱，因为可再生能源占到了该国发电量的三分之一以上。

德国最大两家电力公司之一——莱茵集团(RWE) 56%的电力生产仍依靠煤炭。其股价自 4 月中旬以来上涨了超过四分之一并不奇怪。但尚不清楚莱茵集团能否将其较高的煤炭成本转嫁到客户身上。

在世界最大煤炭生产国——中国发生的事可能给煤炭价格带来了最大的影响。由于中国的煤矿一直在亏本生产，中国政府已经强制企业进行减产——特别是世界最大煤炭企业中国神华(China Shenhua)。如果彻底执行的话，所削减产量可能相当于中国煤炭产出的 13%，比全俄罗斯的煤炭产量还要多。但麦格理(Macquarie)认为，最终削减的产量可能少得多。

中国在煤炭及钢铁领域的过剩产能不会这么容易就消失。除非油价出现飙升，否则对煤炭燃起的热情将很快冷却。

## Coal bears gripped by Chinese capacity squeeze

If the first rule of macro trading is "don't fight the Fed" then the first rule of raw materials must be "don't fight Beijing".

It is a truth coal traders are discovering after China upended the market with plans to impose a five-day working week in a bid to cut overcapacity.

Since the policy was announced in March, the price of thermal coal has risen by 20 per cent as Chinese traders have been forced to chase cargoes in the seaborne market or draw down stocks.

The rally has wrongfooted many market participants who were betting on another year of falling prices for thermal coal, which is used to generate electricity and is a source of profits for mining houses such as Glencore and Rio Tinto.

At least one big participant, traders say, has been caught on the wrong side of a major position that was designed to protect against falling prices. Beijing's directive has also turned on its head the widely held view that Chinese imports of thermal coal would dwindle from the 140m tonnes purchased last year.

"Thermal coal bears, among which we were one of the biggest, have been reminded this year that it is not wise to fight the Chinese government," says Colin Hamilton, head of commodity research at Macquarie. "As long as China remains a meaningful thermal coal importer, it will act as a price setter."

For years China has been trying to put coal on a more stable footing, but the latest reforms are some of the first to have an immediate impact on the broader market. Mines normally operate 24 hours a day, seven days a week.

The benchmark price for Asia — thermal coal shipped from the Australian port of Newcastle — is up by more than a quarter since its lows in January and now trades above $61 a tonne. Other coal markers have seen similar gains but remain well below their 2008 peaks of nearly $200 a tonne.

Analysts estimate domestic production in China was down 10 to 15 per cent in May from a year ago, while latest official data point towards rising imports.

"Before China announced its 'de-capacity' efforts, we thought seaborne imports would fall to about 110m tonnes [this year]. But now, we think they'll hold at 140m tonnes or maybe even get a bit higher," says Andy Roberts, head of thermal coal research at Wood Mackenzie, a consultancy.

Analysts say the decline in domestic production has coincided with increased demand in China, as power consumption picks up over the hot summer months. Morgan Stanley reckons coal-fired power production rose 5 per cent month-on-month in June and will rise further through July and August.

"The combination of rising demand growth and impaired supply has prompted an inventory drawdown," says Morgan Stanley analyst Tom Price.

Globally, thermal coal production has been declining for more than a year as the collapse in prices has forced miners to scrap new projects.

But traders who handle millions of tonnes of coal a year say the recovery in prices cannot be solely explained by decisions taken by China. A weaker US dollar and the oil price, which has almost doubled from its January low, have also contributed. Another influence has been the derivatives market.

Traders say a producer had been selling call options to banks in the over-the-counter market. These trades, known as covered positions, were profitable as long as prices kept declining. But that is no longer true. A seller of a call option pockets a premium upfront but delivers an asset at a specified price or time if it is exercised by the holder.

Faced with growing losses on the call options as coal prices rallied through June, traders say the producer has been forced to buy futures contracts to hedge its position. But the volume of futures it has been trying to buy has been so big that it has pushed up prices.

The view in the market is that the call options expire in September and December, one reason traders believe prices might have peaked for 2016.

"We do not expect this China induced tightness to hold beyond the next couple of months," says Mr Hamilton. Others are not sure. Citigroup says prices could hit $90 a tonne if La Niña brings heavy rain to Australia and Indonesia.

## 中国限产让看跌煤炭者失手

如果"不要与美联储(Fed)对抗"是宏观交易的第一准则，那么原材料市场的第一准则肯定是"不要与中国对抗"。

这是煤炭交易商正在发现的一个真理，此前中国计划强制执行每周 5 天工作制以削减过剩产能，此举

颠覆了市场。

自从今年 3 月中国宣布这项政策以来，热煤价格已上涨 20%，中国交易商被迫抢购海运市场的货源或削减库存。

煤炭价格上涨令很多市场参与者措手不及，此前他们押注于热煤价格经历又一个价格下跌之年。用于发电的热煤是嘉能可(Glencore)和力拓(Rio Tinto)等矿业公司的利润来源。

交易商表示，至少有一家大型参与者在旨在对冲价格下跌的大笔交易头寸上失手。中国的指令还颠覆了这种普遍观点：中国热煤进口将低于去年购买的 1.40 亿吨。

“看跌热煤价格的机构（我们是其中规模最大的机构之一）今年被提醒，与中国政府对抗是不明智的，”麦格理(Macquarie)大宗商品研究主管科林•汉密尔顿(Colin Hamilton)表示，“只要中国仍是重要的热煤进口国，它就会设定价格。”

多年来，中国一直试图提升煤炭市场的稳定程度，但最新改革是对整体市场产生立竿见影效果的首批措施之一。煤矿通常每天 24 小时、一周七天运营。

亚洲基准价格（从澳大利亚港口纽卡斯尔发运的热煤价格）较今年 1 月的低点上涨逾四分之一，如今位于每吨 61 美元的上方。其他煤炭基准价格出现类似上涨，但仍远远低于 2008 年每吨近 200 美元的峰值水平。

分析师们估计，今年 5 月中国国内煤炭产量同比下降 10%至 15%，同时最新官方数据表明进口增加。

咨询公司 Wood Mackenzie 热煤研究部主管安迪•罗伯茨(Andy Roberts)表示：“在中国宣布‘限产’举措之前，我们曾认为，（今年）海运进口将降至 1.10 亿吨左右。但如今，我们认为，进口量将保持在 1.40 亿吨甚至可能更高一点。”

分析师们表示，国内产量下滑的同时，中国需求上升，因炎热的夏季耗电量增加。摩根士丹利(Morgan Stanley)估计，今年 6 月燃煤发电量环比增长 5%，7 月和 8 月将进一步增长。

摩根士丹利分析师汤姆•普赖斯(Tom Price)表示：“需求增速加快以及供应受限的双重作用，已导致库存下降。”

从全球来看，热煤产量下滑已持续一年多，价格暴跌迫使矿商取消新项目。

但每年经手数百万吨煤炭的交易商表示，中国做出的决定不能完全解释煤炭价格复苏。美元贬值和油价（较 1 月低位上涨近一倍）也起到了一定作用。另一个影响因素是衍生品市场。

交易商表示，一家生产商曾在场外交易市场向银行卖出认购期权。这些交易被称为抵补头寸，只要价格一直下跌就能盈利。但现在情况变了。认购期权卖家将在交易之时斩获一次清偿权利金，但在期权持有人行权时须以特定价格或在特定时间交付资产。

随着整个 6 月煤炭价格出现上涨，面对日益加剧的认购期权亏损，交易商们表示，这家生产商被迫买入期货合约以对冲其头寸。但该生产商试图购买的期货合约数量非常大，以至于推高了煤炭价格。

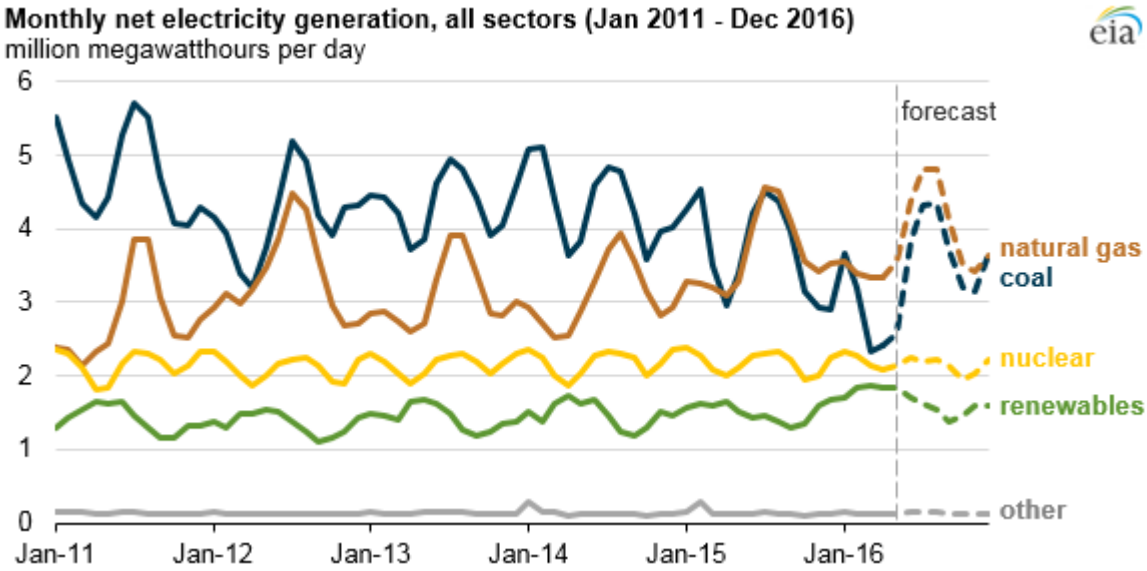
市场认为，这些认购期权将在 9 月和 12 月到期，这是交易商们认为 2016 年煤炭价格可能已经见顶的一个原因。

汉密尔顿表示：“我们认为，中国引发的市场吃紧状况不会持续到未来两个月以后。”还有一些人则不那么确定。花旗集团(Citigroup)表示，如果“拉尼娜”气候给澳大利亚和印尼带来强降雨，煤炭价格可能会达到每吨 90 美元。

# *Electricity（电力）*

## Natural gas-fired electricity generation expected to

# reach record level in 2016




Source: U.S. Energy Information Administration, Short-Term Energy Outlook July 2016

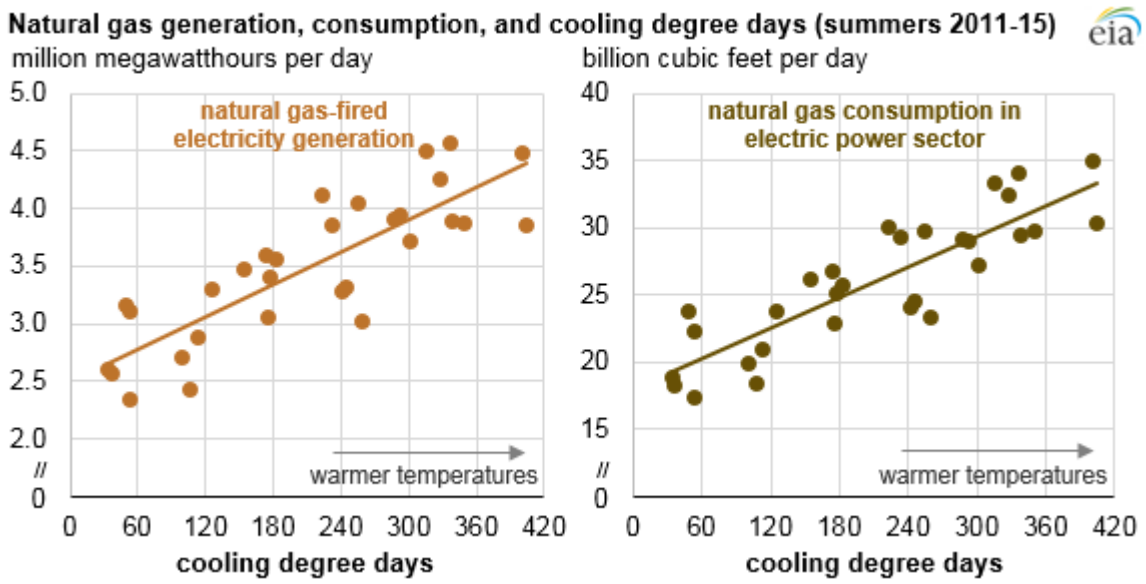
Natural gas-fired electricity generation in the United States is expected to reach a record level this year, providing an average of 3.8 million megawatthours per day in 2016, or 4% higher than in 2015. Based on EIA's latest Short-Term Energy Outlook (STEO), monthly natural gas-fired generation is expected to reach record highs in July and August, when weather-related demand for air conditioning increases electricity demand.

Natural gas had long been the second-most prevalent fuel for electricity generation behind coal. Natural gas-fired generation first surpassed coal generation on a monthly basis in April 2015. Natural gas-fired generation has surpassed coal-fired generation in most months since then and is expected to continue to exceed coal generation through the remainder of the year, ultimately providing 34% of the United States's electricity generated this year. Coal's share of the 2016 U.S. electricity generating mix is expected to be 30%, nuclear, 19%, and renewables, 15%.

Notably, the natural gas share of power generation is expected to decline for several years after 2016 as it competes with renewables and as natural gas prices rise. In EIA's Annual Energy Outlook 2016 Reference case, the natural gas generation share falls until about 2020, then climbs steadily over the next two decades. Natural gas is projected to regain the largest share in the electricity mix by 2022 and maintain that position through 2040.

Forecasted electricity demand is sensitive to weather predictions. The National Oceanic and Atmospheric Administration (NOAA) expects that the summer of 2016 (April through September) will have about as many cooling degree days as the summer of 2015. Cooling degree days reflect the population-weighted temperature difference from a base temperature of 65 degrees Fahrenheit. Nationally, the number of cooling degree days is expected to reach a high of about 360 in July 2016, or about 10% lower than the monthly record of 404 cooling degree days set in July 2011.

As temperatures increase, demand for air conditioning increases. Much of that increase in electricity demand is met by natural gas-fired generation. On a monthly average basis, each increase of 1 degree Fahrenheit above 65 degrees translates to about 30 additional cooling degree days. Based on historical cooling degree days and natural gas-fired electricity generation for the summer months of each year since 2011, for every additional 30 cooling degree days, another 140,000 megawatthours per day of natural gas-fired electricity and an additional 1.4 billion cubic feet per day of natural gas is consumed.

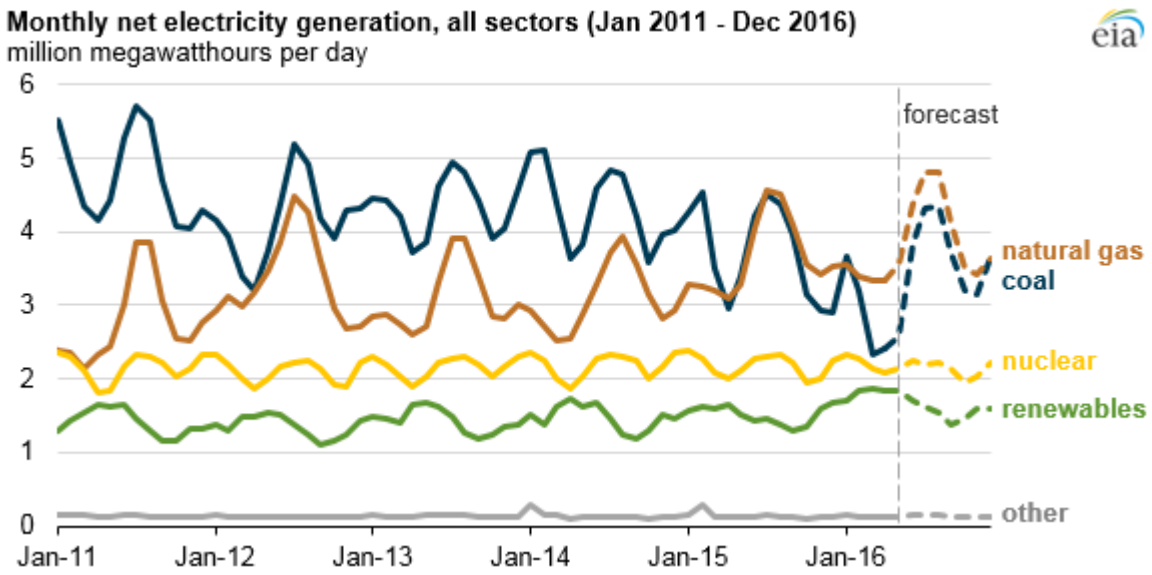



Source: U.S. Energy Information Administration, Short-Term Energy Outlook July 2016

Note: Summer months are April through September.

Even though natural gas-fired generation has increased in recent years, it is expected to decline slightly in 2017 as natural gas prices increase. Spot prices at the benchmark Henry Hub have increased recently, from a monthly average of $1.92 per million British thermal units (MMBtu) in May to $2.59/MMBtu in June, the highest monthly Henry Hub spot price since September 2015. Based on the latest STEO forecast, EIA expects natural gas spot prices to remain low enough to support record-high natural gas-fired generation in 2016. In 2017, as spot natural gas prices continue to increase, natural gas-fired generation is expected to decrease by about 2%.

## 天然气发电有望在 2016 年到达新纪录




来源：美国能源信息管理局，2016 年 7 月《短期能源展望报告》

美国的天然气发电有望在今年取得新纪录，2016 年平均每天 380 万兆瓦时，比 2015 年高 4%。基于 EIA 最新《短期能源展望报告》（STEO），每月天然气发电有望在七月和八月达到新纪录，与天气有关的

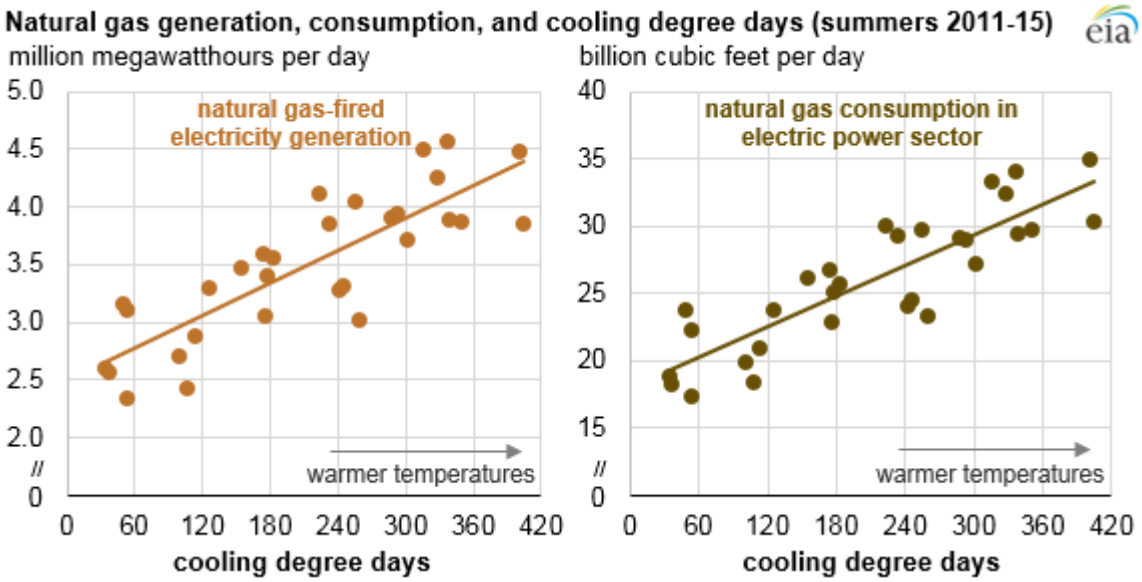
对空调的需求会增加电力需求。

天然气长期以来都是除煤炭以外第二普遍的用于发电的燃料。天然气发电在 2015 年 4 月首次超越煤炭发电。从那时起，有望继续超过煤炭发电。2016 年美国发电方式中的煤炭份额有望达到 30%，核发电 19%，可再生能源 15%。

尤其是，因为天然气与可再生能源的抗争以及天然气价格上升，发电量中的天然气份额有望在 2016 年后下降几年。在 EIA 年度能源展望 2016 参考案例中，天然气发电份额一直下跌到 2020 年左右，然后在接下来的二十年中稳步上升。天然气预计在 2022 年会重获最大份额，保持这个位置一直到 2040 年。

预计的电力需求对天气预测敏感。国家海洋和大气管理局(NOAA)预计 2016 年夏天（4 月到 9 月）会和 2015 年夏天的冷度日一样多。冷度日从 65 华氏度的基本温度反映了人口加权气温差异。就全国范围而言，冷度日的数量有望在 2016 年 7 月达到新高点 360 天，或者比 2011 年 7 月设置的 404 个冷度日的月度记录低 10%。

随着气温上升，空调需求增加。许多电力需求的增加与天然气发电一致。在月度平均值基础上，65 度以上每增加 1 华氏度，就增加了 30 个冷度日。在 2011 年后每年夏季的历史冷度日和天然气发电基础上，每增加 30 个冷度日，就每天多耗费天然气电 140000 兆瓦时和 14 亿立方英尺的天然气。

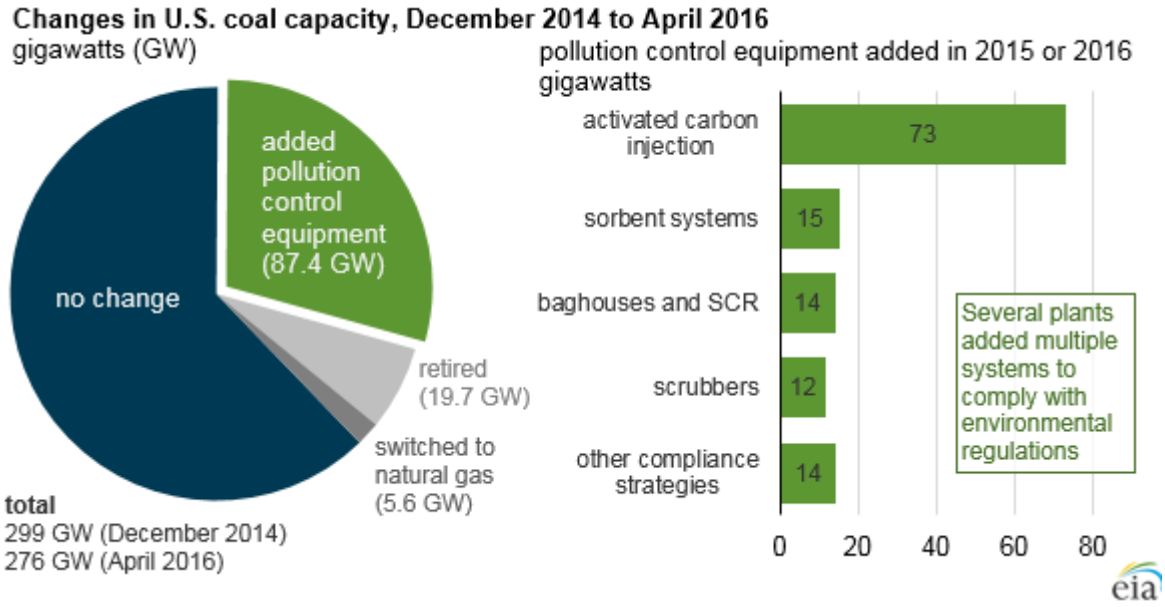



来源：美国能源信息管理局，2016 年 7 月《短期能源展望报告》

注释：夏季从 4 月到 9 月

尽管天然气发电在最近几年有所增加，但是 2017 年随着天然气价格上升可能会轻微下降。亨利中心的基准现货价格最近一直在上涨，从 5 月的月平均值每 1.92 美元/MMBtu 上升到六月的 2.59 美元/MMBtu，也是 2015 年 9 月以来最高的亨利中心现货价格。以最新的 STEO 预测为基础，EIA 认为天然气现货价格有望保持低位以支持 2016 年天然气发电的新高。在 2017 年，随着现货天然气价格继续增加，天然气发电预计会降低 2%。

# EIA electricity generator data show power industry response to EPA mercury limits




Source: EIA, Annual Electric Generator Data (EIA-860) Early Release and Preliminary Monthly Electric Generator Inventory (EIA-860M)

Note: SCR is selective catalytic reduction.

EIA recently released preliminary data from its annual survey of electric generators (EIA-860), which provides information on pollution control equipment at electric power plants. A significant number of electric power plants recently installed such equipment in response to the U.S. Environmental Protection Agency's (EPA) Mercury and Air Toxics Standards (MATS).

MATS establishes emissions limits for toxic air pollutants associated with coal combustion such as mercury, arsenic, and heavy metals. MATS requires all coal generators that sell power and have capacity greater than 25 megawatts (MW) to comply with specific emission limits by April 2015, although some units received extensions, as discussed below. Although hundreds of coal generators have capacities below 25 MW, those units collectively represent less than 1% of total coal capacity.

Coal-fired generating capacity in the United States dropped from 299 gigawatts (GW) at the end of 2014 to 276 GW as of April 2016. Coal-fired generation's share of total electricity generation fell from 39% in 2014 to 28% in the first four months of 2016. These changes can be attributed to a mix of competitive pressure from low natural gas prices and the costs and technical challenges of environmental compliance measures.

Between January 2015 and April 2016, about 87 GW of coal-fired plants installed pollution control equipment and nearly 20 GW of coal capacity retired. Twenty-six percent of those retirements occurred in April 2015, the MATS rule's initial compliance date. Most remaining coal plants applied for and received one-year extensions that allowed them to operate until April 2016 while developing compliance strategies. If a coal unit did not meet MATS requirements by then, it had to either retire, switch to another fuel, or cease operation. A few plants, totaling 2.3 GW, received additional one-year extensions, giving them until April 2017 to comply. About 5.6 GW of coal capacity fuel switched primarily to natural gas.

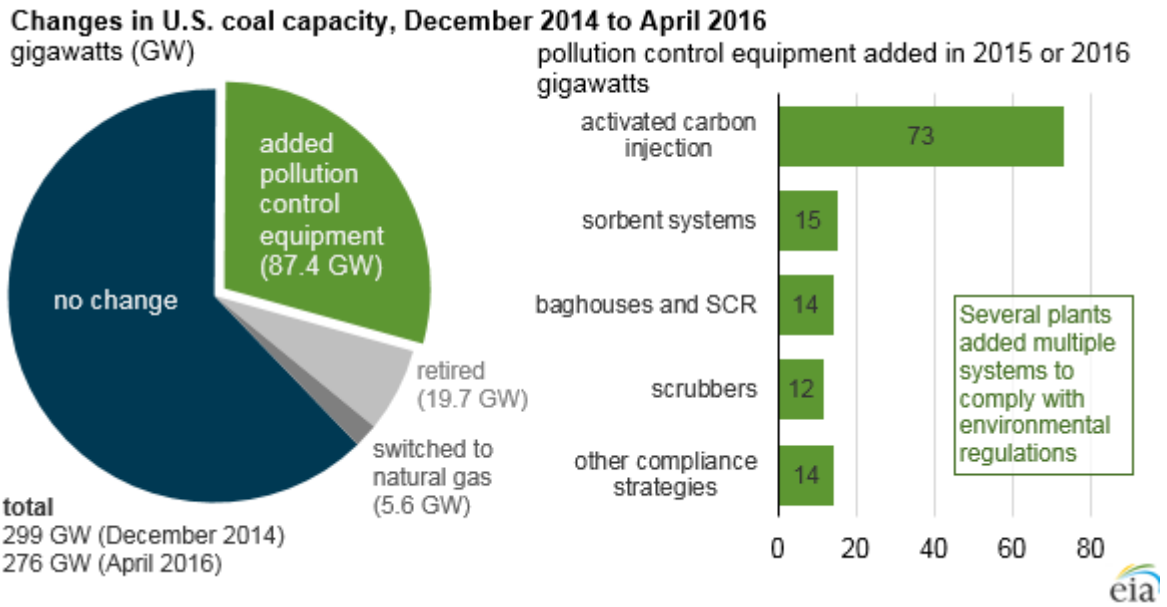
Of the 87 GW of coal capacity that installed pollution control equipment to comply with MATS, activated carbon injection (ACI) was the dominant compliance strategy. More than 73 GW of coal-fired capacity installed ACI systems in 2015 and 2016, effectively doubling the amount of coal capacity with ACI. As a capital investment, ACI systems are relatively modest, with an average cost of $5.8 million per generator over 2015 and 2016.

Other compliance strategies include the modification of existing emissions control equipment, the addition of new equipment or capabilities, or some combination of operational changes and new investments to improve mercury

capture or to achieve other environmental control objectives, such as reducing emissions of particulate matter or nitrogen oxide. Many generators may have installed more than one type of equipment. Overall, operators invested at least $6.1 billion from 2014 to 2016 to comply with MATS or other environmental regulations.

Although EIA's data are preliminary, 98% of coal capacity status is reported to EIA on a monthly basis, meaning the uncertainty associated with the values presented here is relatively small. Full-year 2016 information will be reported to EIA in 2017 and made available later that year.

## EIA 发电厂数据显示了电力行业对美国环保局水银限制的反应




来源：EIA，年度发电厂数据 (EIA-860) 早期版本和每月发电厂初步库存 (EIA-860M)

注释：SCR 是选择性催化还原

美国电子工业联合会(EIA)最近发布了发电厂（EIA-860）年度调查的初始数据，为发电厂的污染控制设备提供信息。大量的发电厂为了响应美国环境保护署（EPA）精神和暨有毒气体排放标准（MATS）都安装了这种设备。

MATS 建立了与煤燃烧有关的有毒气体污染物如汞、砷和重金属的排放限制。MATS 要求所有的销售电能，容量大于 25 兆瓦的煤电厂自 2015 年 4 月起遵守特定排放限制，尽管一些单位有所扩张，就像下面讨论的一样。虽然几百个煤电厂的电量不到 25 兆瓦特，但是这些单位总共用了不到 1%的煤量。

美国的煤炭发电能力从 2014 年末的 299 吉瓦降低到 2016 年 4 月的 276 吉瓦。总发电量中的煤炭发电份额从 2014 年的 39%降低到 2016 年前四个月的 28%。这些变化原因在于低廉的天然气价格的竞争压力以及环境顺从举措的技术挑战。

2015 年 1 月和 2016 年 4 月间，大约 87 吉瓦的煤炭发电厂安装了污染控制设备，减少了近 20 吉瓦的煤炭量。其中 26%的煤炭发电厂在 2015 年 4 月不再使用，也就是 MATS 规则的起初顺从日期。大多数保留下来的煤炭发电厂继续使用，有一年的延长期限，在 2016 年 4 月前允许它们在发展顺从战略的同时继续运行。如果到那时煤炭发电厂仍然不能满足 MATS 的要求，就必须关闭，向其他燃料转变，或者停止运行。一些发电厂，总量 2.3 吉瓦，获得了一年额外的延长期限，可延长至 2017 年 4 月。大约 5.6 吉瓦的煤炭燃料主要向天然气转变。

在遵从 MATS 要求、安装污染控制设备的 87 吉瓦煤炭量中，活性炭喷射吸附方法（ACI）是主要的策略。超过 73 吉瓦的煤炭发电厂在 2015 年和 2016 年安装了 ACI 系统，有效地用 ACI 翻番了煤炭量的数量。作为资本投资来说，ACI 系统相对温和，2015 年和 2016 年每个发电厂的平均成本 580 万美元。

其他的兼容战略包括改变现有排放控制设备，增加新设备或容量，或结合操作变化和新投资，来提高汞或达成其他环境控制目标，例如减少微粒物质或氧化氮的排放量。许多发电厂也许安装了不止一种设备。总体上来说，经营者从 2014 年到 2016 年投资了至少 61 亿美元，来遵从 MATS 或其他的环境管理规则。

虽然 EIA 的数据只是初步的，98%的煤炭量情况是按月报告给 EIA，意味着与这里展现的价值有关的不确定性是相对较小的。2016 年全年的信息将在 2017 年报告给 EIA，那年晚些时候即可获得数据。

# Australia faces fresh test on Chinese investment

The newly elected government of Australian Prime Minister Malcolm Turnbull is set for its first big test on foreign investment, with two Chinese companies bidding for control of the country's largest electricity network.

State Grid Corporation of China and Hong Kong-based Cheung Kong Infrastructure are expected on Monday to submit separate bids of more than A$10bn ($7.47bn) for a 50.4 per cent stake in Ausgrid in a privatisation that is unlikely to attract a local bidder. But the sale of the New South Wales electricity distribution company is drawing sharp criticism from independent politicians, who have gained influence in parliament following a knife-edge election on July 2.

"State Grid is China's biggest state-owned company. Any sale to a foreign government-owned company should raise significant national interest concerns," said Nick Xenophon, a senator whose eponymous party is likely to win three seats in the upper house of parliament.

In a letter to the government seen by the Financial Times, Mr Xenophon expressed concern about State Grid's market dominance if its bid was successful. He also asked whether Canberra had sought the advice of the intelligence and defence forces in relation to the proposed sale, adding that he intended to table a bill to tighten Australia's foreign investment rules when parliament resumed.

Bob Katter, a Queensland MP with a fondness for guns, cowboy boots and social conservatism, also criticised the proposed sale of Ausgrid, warning that Australia risked becoming "an economy for imperial China".

Chinese investment in the US, Europe and Australia has hit record levels, underlining Beijing's growing importance as a driver of global growth and source of inward investment. But it is prompting scrutiny from regulators, including in Australia where Scott Morrison, treasurer, recently blocked the sale of the vast S Kidman & Co cattle farm to a Chinese group.

Some analysts warn that the election of 10-15 independent and minor party Senators, who will hold the balance of power in the upper house, will heighten pressure on the government to tighten scrutiny of foreign takeovers.

# 澳大利亚再遇中国投资考验

预计中国国家电网公司和香港长江基建将于周一分别递交收购方案，竞购澳大利亚最大电力网络 Ausgrid 的控股权。

澳大利亚总理马尔科姆•特恩布尔(Malcolm Turnbull)领导的新政府将面临首个重大外资考验，两家中国公司正竞购澳大利亚最大电力网络的控股权。

预计中国国家电网公司(State Grid Corporation of China)和总部位于香港的长江基建(Cheung Kong Infrastructure)将于周一分别递交收购方案，以逾 100 亿澳元（合 74.7 亿美元）购入 Ausgrid 50.4%股权，Ausgrid 的私有化方案不太可能吸引本国企业竞标。但这家新南威尔士配电公司的出售招致独立政治人士的尖锐批评，在 7 月 2 日一场竞争激烈的选举后，这些政治人士在议会影响力增加。

澳大利亚参议员谢诺峰(Nick Xenophon)表示："国家电网是中国最大国有企业。将本国企业出售给一家外国政府所有的公司的交易，应该引起重大的国家利益关切。"谢诺峰领导的同名党派可能会在澳大利

亚参议院获得 3 个席位。

在写给澳大利亚政府的一封信中，谢诺峰表达了对国家电网竞购成功后的市场霸主地位的担忧。英国《金融时报》看到了这封信。他还问到澳大利亚政府是否已就此次拟议出售交易征求过情报和国防部门的建议，他补充称，他希望在议会重新开会后提交一项议案，收紧澳大利亚的外国投资规定。

昆士兰议员、喜欢枪支、牛仔靴和社会保守主义的鲍勃•凯特(Bob Katter)也对 Ausgrid 的这宗拟议出售交易提出批评，他警告称，澳大利亚可能会成为“一个为中国帝国服务的经济体”。

中国在美国、欧洲和澳大利亚的投资近来达到创纪录水平，突显出中国作为全球增长驱动力以及招商引资来源的重要性日益上升。但这正引发监管机构的严密关注，包括最近澳大利亚财长斯科特•莫里森(Scott Morrison)否决了将大型养牛场基德曼公司(S Kidman & Co)出售给一家中资集团的交易。

一些分析人士警告称，10 至 15 名独立议员和少数党派议员的当选，将使他们掌握参议院的实力平衡，他们将加大要求政府收紧外资收购审查的压力。

# How China can stop wasting wind energy

Faster electricity market reform is needed to harness more wind and speed up a shift from coal, two experts tell chinadialogue

China has roughly one third of global installed wind energy capacity, while the US has 17%. Yet China uses less wind-powered electricity than the US. What is going wrong?

Energy market structures and politics limit the uptake of wind energy by the grid, according to renewable energy specialists. Two of them shared their views with chinadialogue to explain what is causing the problem, and put forward solutions.

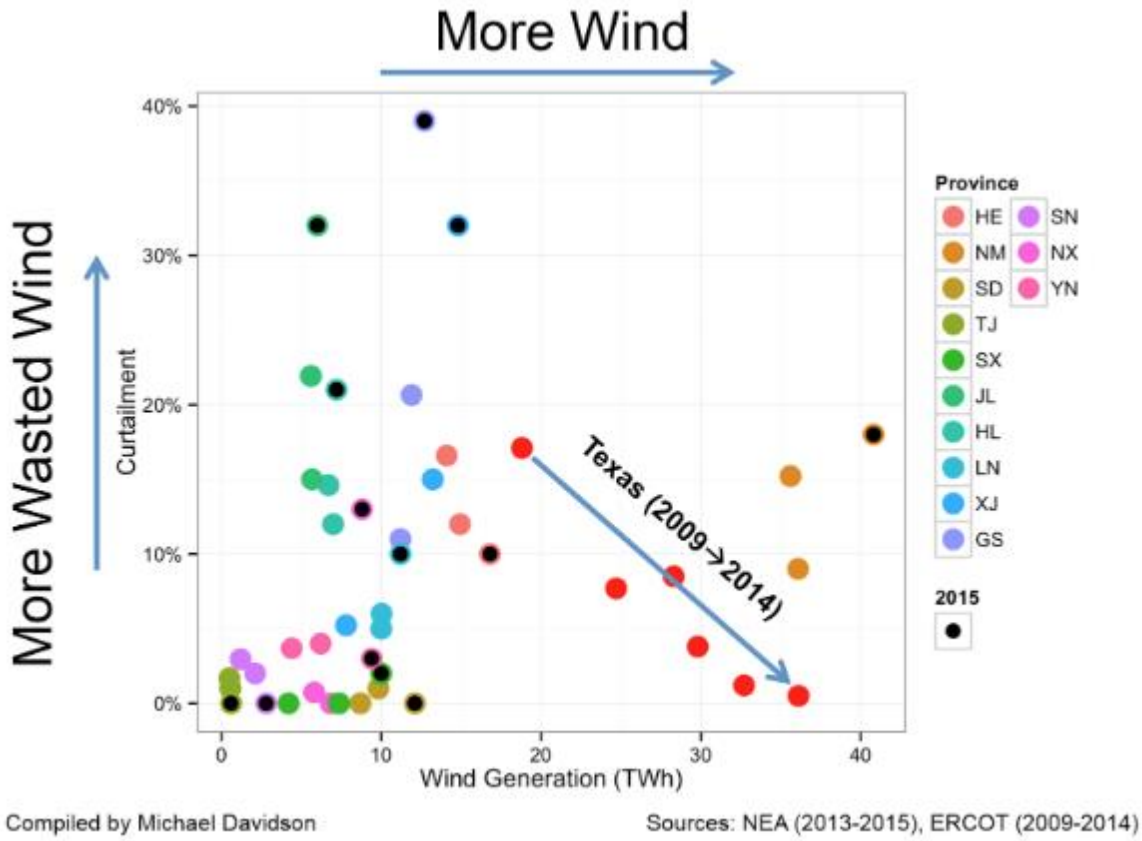
Michael Davidson is a researcher at Massachusetts Institute of Technology specialising in renewable energy utilisation, while Tsinghua University assistant professor Ning Zhang researches power system planning.

chinadialogue (CD): What is China doing to promote wind energy integration from a policy standpoint and how does it rank globally?

Michael Davidson (MD): China has put in place polices to develop wind energy since the 2006 Renewable Energy Law, but actual generation of electricity from wind falls short of expectations, given its high capacity. By 2010, many regions started experiencing high levels of “curtailment”; when wind energy is available but the grid operator instructs wind farms not to put all of it onto the grid, effectively wasting it.

Many countries with high levels of wind energy deployment experience curtailment. Texas, prior to 2012, experienced some of the highest rates outside of China, though they have now declined to near-zero (see diagram). As part of the joint US-China statements on climate change before the Paris talks, President Xi Jinping announced that the country would develop “green power dispatch” to improve wind integration on the grid building off existing integration policies. China has also pledged to obtain 20% of power from non-fossil fuels by 2030.

Ning Zhang (NZ): The government primarily supports wind power through subsidies and an acquisition mechanism. In 2003, when wind farms were first set up, the government set a price for wind energy that guaranteed a return on investment. As wind farms became more widespread in 2009, China enacted a “feed in tariff,” a guaranteed fixed purchase price at which the grid would buy electricity. The National Renewable Energy Fund pays the difference between the energy grid companies’ purchasing prices and the “feed in tariff,” to encourage wind energy use.




Key of Chinese provinces: Hebei(HE) ; Neimeng(NM); Shandong(SD); Tianjin(TJ); Shanxi(SX); Jilin(JL); Heilongjiang(HL); Liaoning(LN); Xinjiang(XJ) Gansu(GS); Shaanxi(SN); Ningxia(NX); Yunnan(YN)

CD: What are the roadblocks to greater wind integration in China? What are the technical vs. the political challenges, especially those that are unique to China?

MD: Curtailment is often attributed to “technical” challenges, such as managing the variability of wind power, and mismatches between the location of wind farms, demand centres, and the grid.

However, many of these are better thought of as “techno-economic” challenges, because they are determined by the costs of addressing certain technical limitations. For example, the cost of a coal plant producing at less than its installed capacity, so that more wind energy can be integrated into the grid.

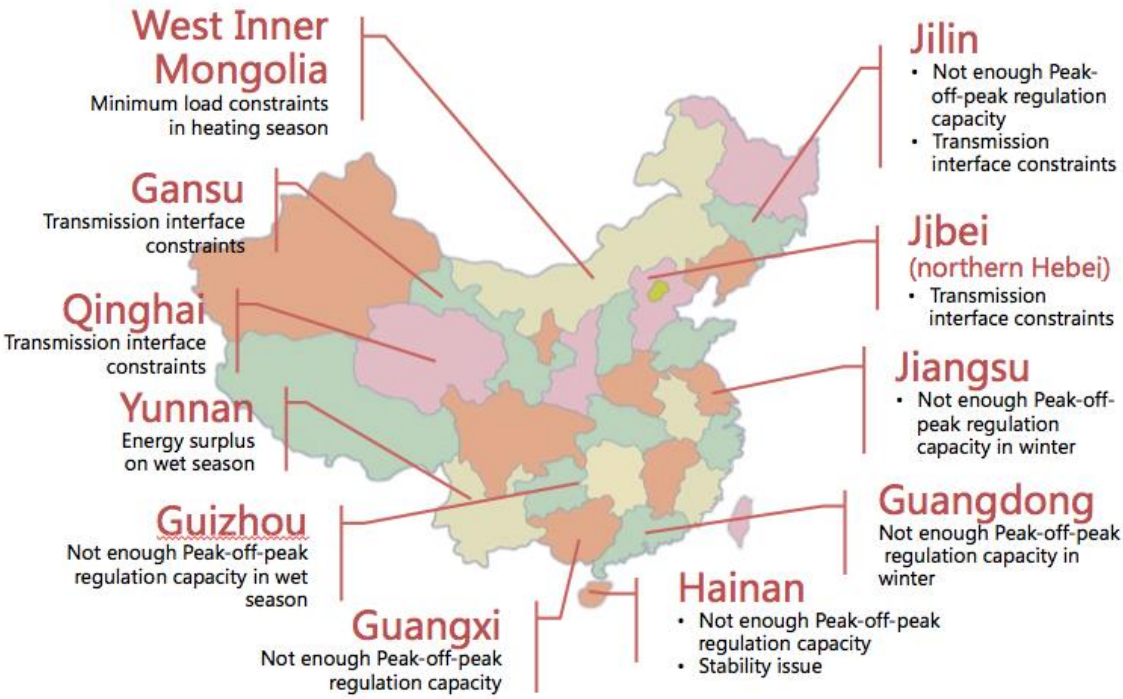
MD: For China, all of the traditional technical issues are relevant. But in addition, China’s electricity sector is operated under a number of other political constraints that exacerbate techno-economic challenges; we recently systematically went through these political-economic challenges of wind in a multiple country context. Because electricity prices are fixed by the central government, they do not respond to changes in supply, such as the availability of wind, or the costs of increasing and decreasing coal generation. Instead, the grid operator administratively determines the coal plant’s minimum output level in advance, which is typically high.

NZ: The technical challenges are that electricity cannot be stored on a large-scale, and generators fail to adjust in real time to changing supply and demand. One of our experiments, looking at two consecutive weeks of the energy grid in Inner Mongolia, revealed that wastage of wind energy mainly occurred at night.

Transmission congestion is another issue. At present, there is a great deal of abandoned wind power in the Jilin and Zhangbei areas because of network congestion.

The fundamental reason is that the national grid focused on the construction of ultra high voltage (UHV, 1000kV) networks, ignoring the construction of the 220kV and 500kV network connecting wind power to the grid.

Currently, most of the bottleneck lies in the 220kV transmission line. Figure 2 summarises the main reasons for abandoning wind in several provinces.




Lastly, there is a big problem with the market mechanism for integrating wind power. Prices, and output, for thermal, hydropower, and gas are formulated by the government. Wind and thermal prices are identical, and there is no penalty for wasted wind energy. As wind farms lack any price advantage over thermal power, grid corporations have no motivation to capture the excess capacity on windy days. Rather, energy dispatching centres usually set the maximum amount of wind energy a day ahead of time, at a level fixed quite low due to the variability of the wind energy supply.

CD: What would make the system more efficient?

MD: Proposed power sector reforms in State Council Document No. 9, revived in 2015 after a decade-long hiatus, highlight important avenues to raise efficiency and improve integration of renewables. Two proposals, reducing the amount of planned wind energy quotas and gradually allowing market-determined generation tariffs, raised in Document No. 9 and subsequent documents, are high on my list. Regulatory changes to bring grid companies more in line with international best practices are also important to eliminate conflicts of interest in dispatching power plants.

Recent work with colleagues showed that if China reduces the minimum output level of coal plants and makes more frequent and flexible scheduling decisions, wind alone could reach 14% of primary energy in 2030—almost three quarters of the way toward its 2030 target [of 20% of power from non-fossil fuels]. Adding on other low-carbon sources, this means China could raise its commitment to non-fossil deployment.

NZ: Changes are needed to allow for more flexibility. China's wind power consumption needs a more flexible pricing mechanism, that allows for a spot market, a short-term market, rather than long term contracts. Allowing wind farms to make independent pricing decisions would let the price of electricity better respond to real time changes in supply and demand and increase their competitiveness.

China's current thermal-based power generation structure and large-scale power transmission makes it hard to accept intermittent power. Increasing more flexible power supplies such as gas power plants and increasing multi-energy system integration would help. Presently, different energy systems are relatively isolated.

CD: What are some of the things you feel are poorly explained in Chinese and US media discussions on China's renewable energy grid integration that you think the public should know?

MD: One area that could be better explained is the effect of overcapacity. In one stark example, China built 51 gigawatts (GW) of new coal plants in 2015 despite a decrease in coal use in the electricity sector. Under a fixed price plan, the outcome is different: the quota must be spread out to more coal plants, there is pressure to raise the overall quota and a shrinking the space left over for wind. Stopping coal overcapacity could open up more opportunities for wind, though it will not address the other flexibility obstacles to wind energy.

NZ: Domestic media reports sometimes misunderstand the real cause of low renewable energy consumption. The root cause of the problem is usually not technical, but lies in the lack of market mechanisms. Often the finger is pointed at grid companies and the solution is simply that the government needs to strengthen policy enforcement of wind power consumption.

However, the government releases documents to encourage greater wind consumption every year, while wind curtailment remains a significant problem. It's clear that publishing documents that force grid companies to accommodate wind power doesn't work and that more flexible market, price, and scheduling mechanisms need to be implemented to create incentives for conventional energy, grid companies, and even consumers to accommodate more wind power.

## 中国如何解决弃风问题？

中国是世界上最大的风电生产国，但其中很大部分无法并网使用。两位可再生能源专家对此做出解释并指出今后中国在此方面需要做的努力。

中国风电装机占全球风电装机总量的近三分之一，而美国仅占 17%，但是中国风电用量却比美国低。这是为什么呢？

可再生能源专家们称，这是因为现有的能源市场结构限制了风电上网。其中两位专家向中外对话解释了导致这一现象的原因并提出了一些解决方案。

一位是美国麻省理工学院可再生能源利用领域研究员迈克尔•戴蔚森；另一位是清华大学电机系电力系统规划讲师张宁。

中外对话（以下简称“中”）:中国目前采取了什么政策措施促进风电能源并网？从全球范围来看，这些措施的力度怎么样？

迈克尔•戴蔚森（以下简称“戴”）:自 2006 年施行《可再生能源法》以来，中国落实了许多推动风电发展的政策，但是基于目前庞大的产能，其实际发电量并没有达到预期。2010 年以前便有许多地区开始大规模“弃风”，电网调度部门限制风电场并网配额，极大地浪费了风电资源。

许多国家也曾有过在电网调度上大规模弃置风电的经历。尽管现在美国德克萨斯州的弃风率趋近于零（如下图所示），但在 2012 年之前，该地弃风率是中国以外地区中最高的。在巴黎气候峰会召开之前，中美两国发布了《中美气候变化联合声明》。中国国家主席习近平在声明中表示，中国将推动“绿色电力调度”，促进风力发电上网。同时，中国还计划到 2030 年将非化石能源占一次能源消费比重提高到 20%。

张宁（以下简称“张”）:中国政府通过补贴和收购机制支持风电产业发展。2003 年，国内风电场刚刚起步之时，政府确定了风电电价以确保风电投资收益。到了 2009 年，风电场开始得到大力发展，当时政府开始执行“上网电价补贴”，确保电网以固定的价格购买风电。为了鼓励使用风电，电网公司购买风电的价格和“上网电价”之间的差价由国家可再生能源发展基金支付。

中:是什么阻碍了中国提高风电并网呢？中国面临的技术与政治挑战，尤其那些中国所独有的挑战又有哪些？

戴: 导致弃风的原因经常被认为是技术层面的，比如如何调节风力资源不稳定这一情况，如何应对风电场、用电需求中心、电网之间位置不匹配等。

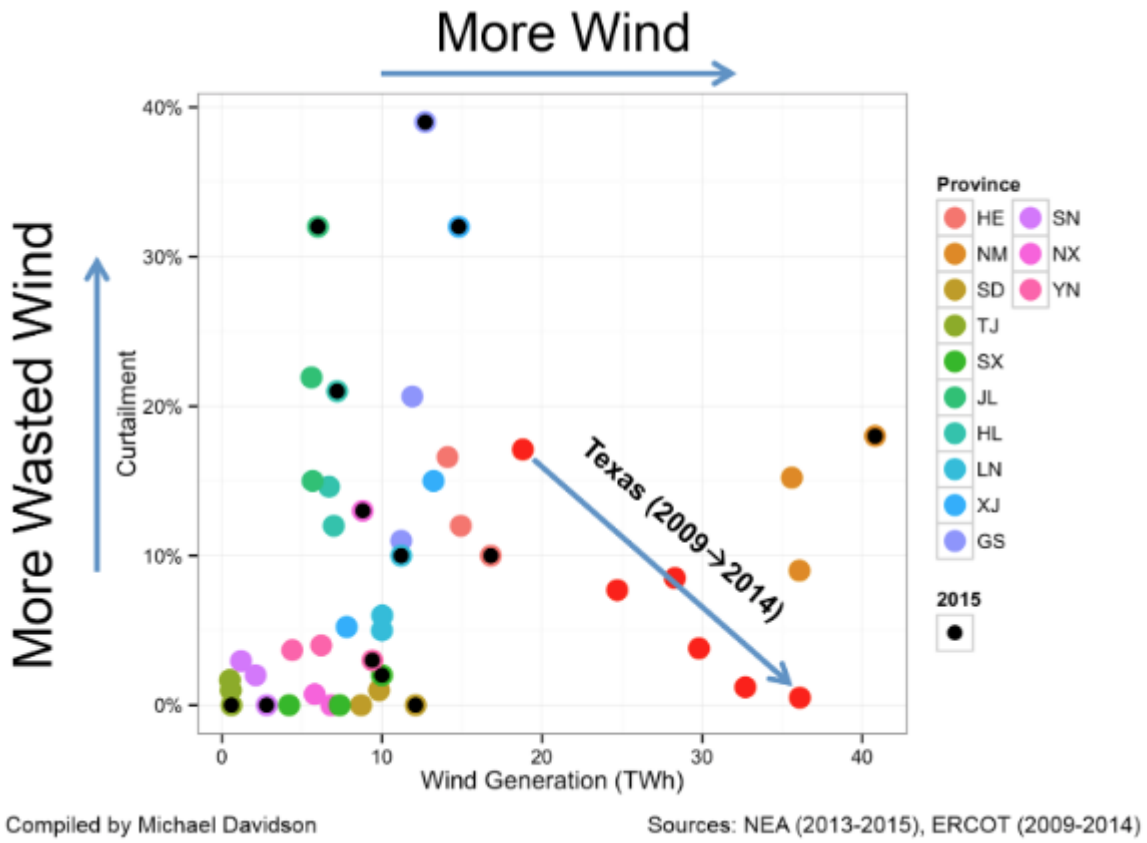
然而，我们会倾向于将诸如此类的许多问题归于“技术经济类”问题。因为能否有效解决这些问题取决于突破某项技术限制所耗费的成本。比如说，当关闭一座低效燃煤电厂的成本足够低时，那么便可以通过关闭燃煤电厂为风电换取更多的上网配额。

戴：对于中国来说，所有传统的技术难题都是相关的。而另一方面，中国电力行业还面临着许多政治束缚，从而加剧了其所面临的技术经济挑战。风电电价由中央政府统一制定施行，无法及时就风能供需变化或火电电价变动作出相应调整。不仅如此，中国电网调度部门还会通过行政手段提前确定燃煤电厂的最低发电量，而且通常标准定的很高。

张：技术难点在于无法大规模贮存风电，而且在实际运营中，不能根据用电供求变化对风电发电量进行调整。我们曾做过一项实验，连续两周对内蒙古电网进行监测，结果发现绝大部分风电是在晚上用电需求不大的情况下被浪费的。

另外，输配不畅也是一个问题。目前，输配不畅已经导致吉林省和河北省张北地区的大量风电被弃置。

最根本的原因在于中国将重心放在 1000kV 超高压电网（UHV）的建设上，忽视了风电上网配套的 220kV 和 500kV 电网的建设。当前，主要的阻碍在于 220kV 输电线路严重不足。图二总结了几个省份“弃风”的主要原因。




最后，风电并网的市场机制还存在一个重大的问题。火电厂、水电厂、燃气电厂的发电量和电价都由政府调控。虽然风电和火电的价格一样，但是目前尚没有针对“弃风”的处罚措施。与火电相比，风电场不具备任何价格优势。刮风的时候，电网公司不仅没有动力去增加发电量，反而会在前一天下达风电场的最高发电。鉴于风能的不稳定性，这一数值是相当低的。

中：怎样才能提高现行的体系的效率?

戴：继 2002 年《电力体制改革方案》出台以后，暌违十多年，2015 年国务院发布了《关于进一步深化电力体制改革的若干意见》（简称“9 号文”），强调要提高效率，改善可再生能源入网难的问题。“9 号

文”及配套文件中的两点提议我认为非常重要：一是减少风电发电量计划配额；二是逐步引入市场定价。改变监管政策，使电网公司与国际最佳实践接轨对消除配电企业的利益冲突也具有重要意义。

我和我同事最近的研究表明，如果中国降低燃煤电厂的最低发电量水平，提高电力调度频率和灵活性，那么到 2030 年，仅风电一项占一次能源消费的比重就可以达到 14%，几乎达到 2030 年目标（到 2030 年将非化石能源占一次能源消费比重提高到 20%）的四分之三。再加上其他低碳能源，中国将顺利实现其推广非化石能源的承诺。

张：需要进行体制改革，加大灵活性。中国的风电消费需要更为灵活的电费定价机制，从而建设发展现货市场、短期市场，避免签订长期供电合同。允许风电场自主定价将有利于其根据供需情况及时作出调整，从而提升竞争力。

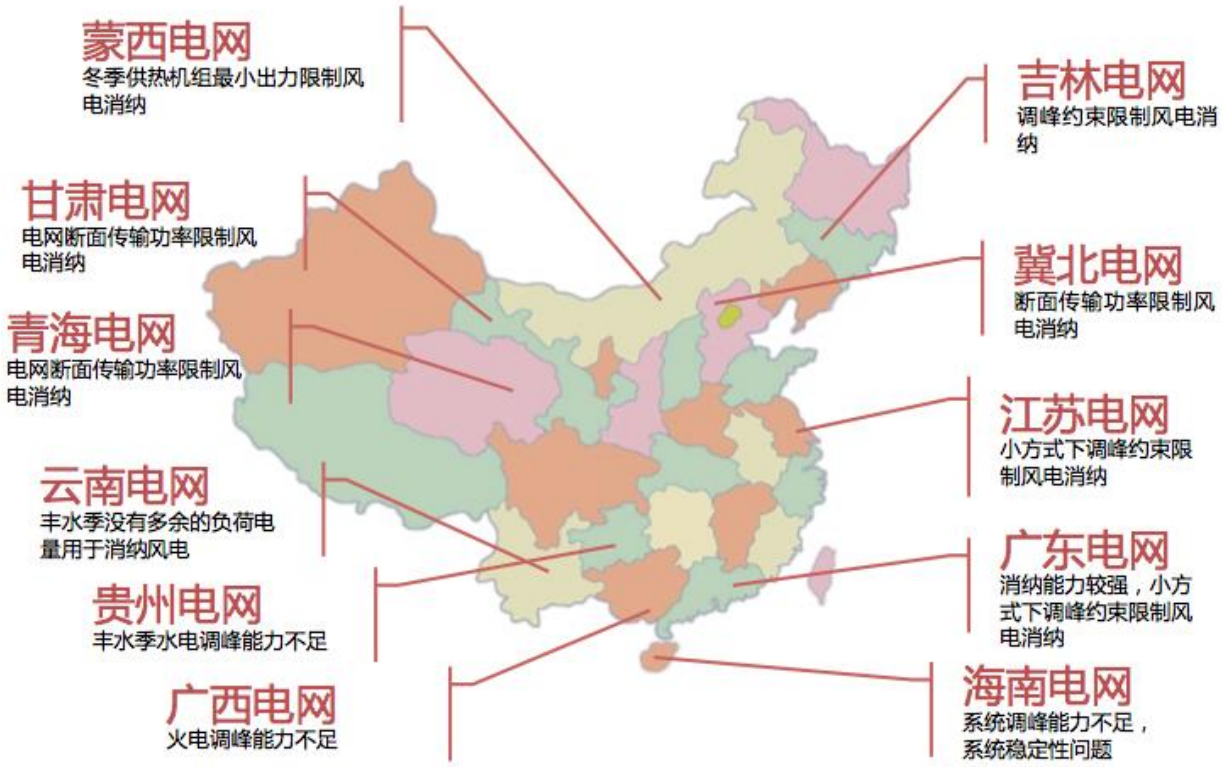
目前中国的能源结构以火力发电为主，且以大规模电力传输为主要输配途径，将不稳定的风电纳入进来是很困难的。增加燃气电厂等更为灵活的能源供给渠道，提高多能源电力系统的并网或许会有助于解决这一问题。然而目前，在中国，不同的能源体系之间都相对独立。

中：中国和美国的媒体都十分关注中国可再生能源并网，您觉得有哪些信息是被两国媒体误解且有必要在此进一步向公众传达的？

戴：我想更好地解释一下过剩产能的影响。举一个很明显的例子，尽管 2015 年电力行业的煤炭消费紧缩，但在这一年，中国新增煤电装机 5100 万千瓦。在钢铁和水泥等行业，产能过剩导致供过于求，产品价格下降，资源使用效率降低，进而影响贸易。而在电力行业，在统一的价格计划下，其结果却是不同的：发电配额分配向燃煤电厂倾斜，导致整体配额紧张，原定风电配额被挤占。去除煤电的过剩产能可以为风电营造更多空间，尽管风电还存在其他不稳定因素阻碍其发展。

张：国内媒体的报道有时候误解了导致可再生能源消费不高的真正原因。这一问题的根本原因通常不在于技术不过关，而在于市场机制的缺失。很多时候，问题的矛头会指向电网公司。这一问题解决起来很简单，那就是政府必须贯彻落实加强风电消费的政策。

尽管政府每年都会发布文件，鼓励风电消费，但是弃风仍然是一个重大问题。很明显，发文要求电网公司消纳风电没有什么效果。我们应该提高市场、价格体系、调度机制的灵活性，激励传统能源行业、电网公司、乃至消费者消纳更多风电。




最后，风电并网的市场机制还存在一个重大的问题。火电厂、水电厂、燃气电厂的发电量和电价都由政府调控。虽然风电和火电的价格一样，但是目前尚没有针对“弃风”的处罚措施。与火电相比，风电场不具备任何价格优势。刮风的时候，电网公司不仅没有动力去增加发电量，反而会在前一天下达风电场的最高发电。鉴于风能的不稳定性，这一数值是相当低的。

中：怎样才能提高现行的体系的效率?

戴：继 2002 年《电力体制改革方案》出台以后，暌违十多年，2015 年国务院发布了《关于进一步深化电力体制改革的若干意见》（简称“9 号文”），强调要提高效率，改善可再生能源入网难的问题。“9 号文”及配套文件中的两点提议我认为非常重要：一是减少风电发电量计划配额；二是逐步引入市场定价。改变监管政策，使电网公司与国际最佳实践接轨对消除配电企业的利益冲突也具有重要意义。

我和我同事最近的研究表明，如果中国降低燃煤电厂的最低发电量水平，提高电力调度频率和灵活性，那么到 2030 年，仅风电一项占一次能源消费的比重就可以达到 14%，几乎达到 2030 年目标（到 2030 年将非化石能源占一次能源消费比重提高到 20%）的四分之三。再加上其他低碳能源，中国将顺利实现其推广非化石能源的承诺。

张：需要进行体制改革，加大灵活性。中国的风电消费需要更为灵活的电费定价机制，从而建设发展现货市场、短期市场，避免签订长期供电合同。允许风电场自主定价将有利于其根据供需情况及时作出调整，从而提升竞争力。

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