美国《清洁电力计划》前途未卜
U.S. Clean Power Plan Faces an Uncertain Future

碳减排目标的地区差异大
Big Regional Differences

虽然很多报道说美国EPA制定的《清洁电力计划》试图让美国电力系统的碳排放总量在2030年比2005年降低30%，但实际上此计划中直接制定的目标是针对碳排放率的，也就是生产每千瓦时电的碳排放量。而总碳排放量比2005年降低30%则是根据EPA的分析预测。

在此计划中，州与州之间的碳排放率的减低目标差异非常大。例如，与2012年相比，到2030年亚利桑那州的碳排放率降低52%，德克萨斯州降低39%，加利福尼亚州降低23%，而北达科他州只降低11%。主要原因是这个计划的设计中考虑了各个地区现有电力系统的差异性，比如现有煤电和天然气发电的能力，可再生能源发电的潜力，以及能效提高的潜力。

Although EPA's Clean Power Plan (the Plan) is often reported as intending to cut overall carbon dioxide emissions by 30 percent below 2005 levels by 2030, the Plan actually specified state-level emission rate reductions, that is, the amount of carbon dioxide emitted per megawatt hour electricity produced. EPA estimates that on a national average level, the Plan will lead to a reduction of US power system carbon dioxide emissions of up to by 30% as compared with the 2005 level.

State-by-state emission rate reductions vary considerably. For example, as compared to the emission rate in 2012, Arizona's rate goal is 52% lower by 2030, Texas' is 39% lower, California's is 23% lower, and North Dakota's is only 11% lower. The main reason for the differences is that the design of the plan considers regional differences in the existing power systems, such as the existing capacity of coal-fired power plants and natural gas power plants, and EPA's views of renewable potential and energy efficiency potential.

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《清洁电力计划》“真相”
The Truths of the Plan

在EPA公布该计划的同时也发布了其对该计划可能造成的影响的分析。分析表明，这个计划的实施会导致更多的煤电提前退休。大概有30吉瓦到50吉瓦的煤电会在2020年前因为这个计划而退休，这

As EPA announced its proposed rule, it also published its Regulatory Impact Analysis using the Integrated Planning Model (IPM). EPA's analysis shows the implementation of the Plan will lead to 30 GW to 50 GW of additional coal plant retirements by 2020 (in addition to about 50 GW

大概在现有煤电的10%到15% （这不包括在没有这个计划的情况下就会有50 吉瓦退休的煤电）。但是，EPA的分析预测这个计划会导致到2030年对新的天然气发电的投资减少30吉瓦。原因是EPA的预测中能效的提高使总的用电需求降低。根据EPA的分析，能效提高会使用电总量在2030年减少11%。另外，在计算碳排放率时只是已有电厂在计算之内，而新的天然气发电厂并不能使各州降低其碳排放强度，这就导致新的天然气电厂不如已有的天然气电厂有价值。最后，可再生能源的发电能力略有增加，到2030年低于10GW。总体来说，美国整体装机能力在2030年不到1000吉瓦，低于2012年的1063吉瓦。

从一次能源的使用来看，电力系统对煤炭的需求到2020年降低25%左右，由原来的844百万吨降低为616到636百万吨左右。而对天然气的需求增长大概10%-14% 左右，由原来的8.35万亿立方英尺增长到9.2到9.54万亿立方英尺之间。值得注意的是，到2030年天然气的电力需求是降低的。这同样也是由于用电需求的降低以及对新的电厂投资的减少。对煤炭需求的降低会导致煤炭价格的降低，有2030年的每百万英热2美元到1.7美元。而天然气的价格到2020年上升大概10%，从每百万英热5美元上升50美分左右，但是到2030年天然气价格几乎没有变化，在每百万英热大概6美元左右。

EPA的分析表明在2020年电力生产的成本上升54到74亿美元左右，而2030年上升73到88亿美元。这里的成本包括因为要达到碳排放标准所导致的增加投资新的电厂以及已有电厂的改造，燃油费用以及电厂运行的费用。这些成本的增长低于EPA所估计的因为排放降低对环境和人的健康状况的改善所带来的利益，使得该计划具有合理性。对于用户来说，EPA的分析预测该计划导致零售电价在2020年全国平均上涨6%左右，到2030年上涨3%左右。但有些地区电价会出现下降。到2030年用户用于电费的总支出却下降8%，同样是因为用电需求的减少。

当然，这些都是EPA的分析。这样的分析结果将来可能会受到挑战。比如有些人可能会质疑EPA在分析的过程当中对于各州的可再生能源的目标的假设，有些人可能会质疑能

of coal retirements in the Base Case without the Plan), which is about 10-15% of the existing coal-fired power plants. However, EPA projects that the Plan will also result in a reduction of 30 GW for new gas power plant investment by 2030 relative to the Base Case without the Plan. The reason is that EPA assumed energy efficiency will lead to dramatic reductions in demand for electricity, and hence less need for new capacity addition. Based on EPA's analysis, energy efficiency could lead to 11% of reduction in total energy in 2030 as compared to the Base Case without the Plan. Another reason for less investment in new gas plants is that in EPA's formula for calculating emission rate, only existing but not new gas power plants reduce the emission rate, which means that new gas power plants are not as valuable as existing power plants. Lastly, renewable energy generating capacity increased slightly, less than 10GW by 2030. Overall, the U.S. installed capacity in 2030 is below 1000 GW, lower than the total installed capacity in 2012 of 1,063 GW.

From the point of view of primary energy consumption, electric demand for coal is forecasted to be reduced by about 25 percent in 2020, from 844 million tons to about 616-636 million tons. The growth in demand for natural gas is around 10%-14% in 2020, increasing from 8.35 tcf to 9.2-9.54 tcf. It is worth noting that gas demand for electricity in 2030 is below Base Case demand, consistent with lower electricity demand and reduced investment in new gas power plants. Reduced demand for coal will lead to lower coal prices from $2/MMbtu to $1.7/MMbtu in 2030. The price of natural gas in 2020 rises about 10 percent, or about 50 cents/MMbtu from $5/MMbtu, but in 2030 natural gas price stays at about $ 6/MMbtu, with little change in natural gas prices from the Base Case.

EPA projects that the total electricity production costs in 2020 will rise about 5.4-7.4 billion dollars and 7.3-8.8 billion dollars in 2030 due to the implementation of the Plan. The production costs include costs for investing new capacity and upgrading existing fleet, fuel costs, and the costs of running and maintaining the plant. However, the benefits brought by the reduction of emission for climate and human health outweigh the cost increase, justifying the Plan. For consumers, EPA's analysis forecasts that the retail price rise about 6% in 2020 and 3% by 2030 on national average while in some regions the price may even decline. By 2030 the total electricity bills (total expenditures for electricity) declines by about 8% because of reduced demand for electricity.

Of course, these are all based on the EPA's regulatory impact analysis, which may face many challenges in the future. For example, some may question if the renewable target assumptions in this analysis

效提高的假设。

are reasonable, and others may challenge EPA's assumption for energy efficiency.

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未来仍十分不确定
The Uncertainties of the Plan

EPA 的这个计划是美国第一个针对现有电力系统的碳排放出台的政策。EPA 声称这个政策是很灵活的：不仅仅局限于化石能源，还包括其他的清洁能源手段，如可再生能源以及能效提高的手段。同时，各州可以在本州的范围内来实行也可以跨州进行区域间的合作。这些灵活性有助于降低实行这一计划的成本。但是在另一方面，面临碳排放减排目标较高的州会认为这不平等。另外，大多数核电厂和水电厂并不在计算公式之内，这些电厂的拥有者会认为他们对碳减排的价值没有被公平的对待。最后，有些人质疑可能会针对 EPA 出台的这个计划是否在《清洁空气

The EPA's Plan is the first national regulation in the US to regulate carbon emissions from existing power plants. EPA claims that the policy is flexible since it is not limited to fossil fuels plants, but allows other means to be qualified as the compliance measures, such as energy efficiency and renewable. Meanwhile, a state can implement the Plan by itself, or choose to collaborate with other states on a regional level. These flexibilities may help to reduce the compliance cost. In addition, the design of the state's emission reduction targets considers regional differences. On the other hand, states which face with more stringent carbon emissions reduction targets may think the Plan is unfair. In addition, most existing nuclear power plants and hydro plants are not accounted for in the calculation of the emission rate. Nuclear and

法案》给它的权利范围之内。比如有些人指出，《清洁空气法案》只是给予 EPA 权利去设定针对电厂的减排目标，并不是针对一个州。

按照现在的计划，EPA 会在 2015 年 6 月正式出台这一计划。在此之后，各州开始要制定州计划为 2020 年达标做好准备。然而与此同时，EPA 也很有可能会面临来自州和电力企业的的各种诉讼。总而言之，奥巴马政府这一具有非常重要意义的政策前途还很不确定。

the hydro plants owners may argue that their value in reducing carbon emissions is not fairly credited. Finally, there is still a question whether the "Clean Air Act" gives EPA the authority to do what it lays out in the Plan. Some have argued that the "Clean Air Act" only gives EPA the authority to set emission reduction targets at the power plant level, but not at the state level.

According to the current timeline, EPA will finalize this rule in June 2015, after which states will be required to set up state implementation plan to comply starting in 2020. However, it is also likely that EPA will be sued by multiple parties including state governments and power companies. So the fate of this important climate policy set by the Obama Administration is very uncertain.

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