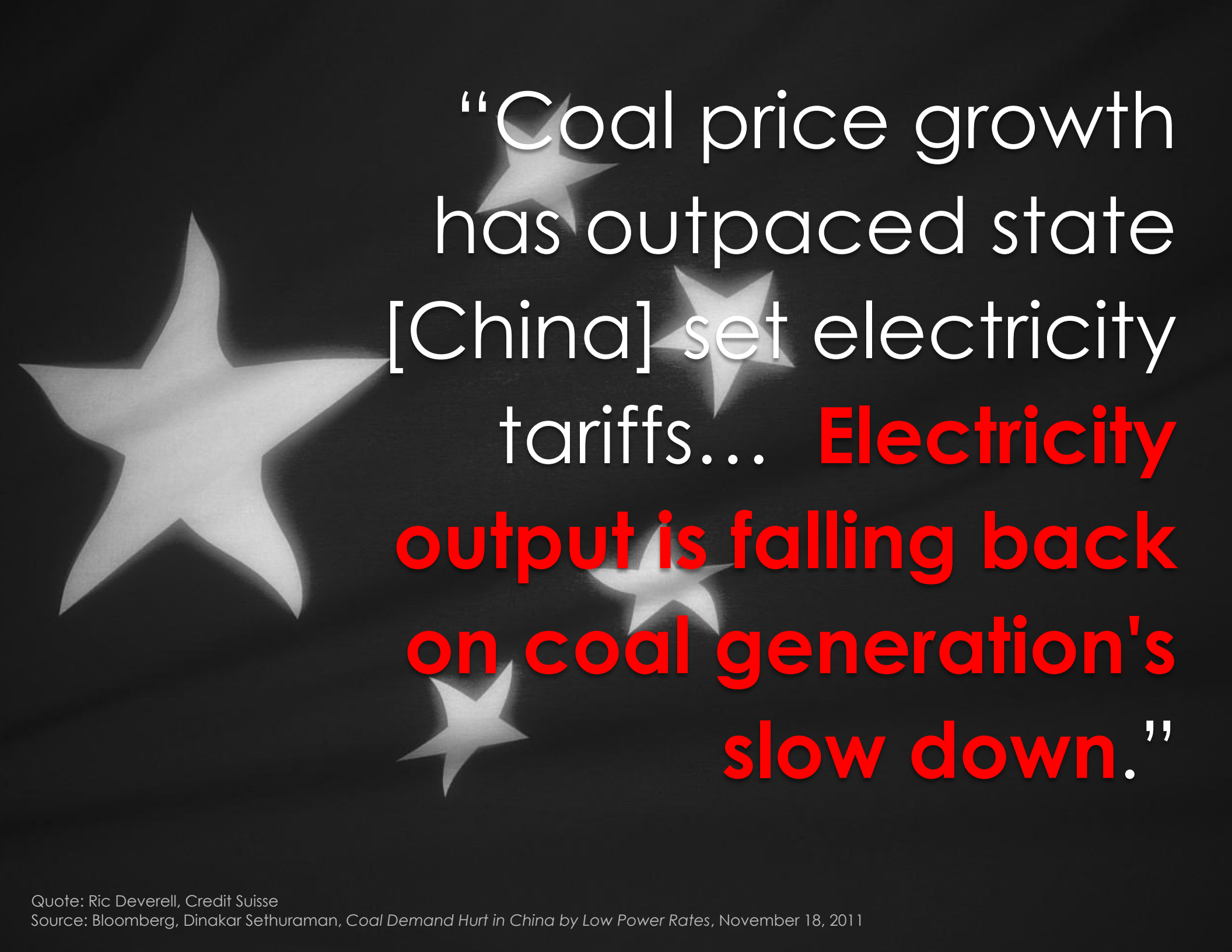




Zpryme Smart Grid Insights Presents:

# China: Electricity Profile

What implications will the dramatic shift in China's electricity cocktail have for the United States and rest of the world?

The background of the slide features a dark field with several white, five-pointed stars of varying sizes, arranged in a pattern reminiscent of the Chinese national flag. The stars are semi-transparent, allowing the text to be seen through them.

“Coal price growth has outpaced state [China] set electricity tariffs... **Electricity output is falling back on coal generation's slow down.**”

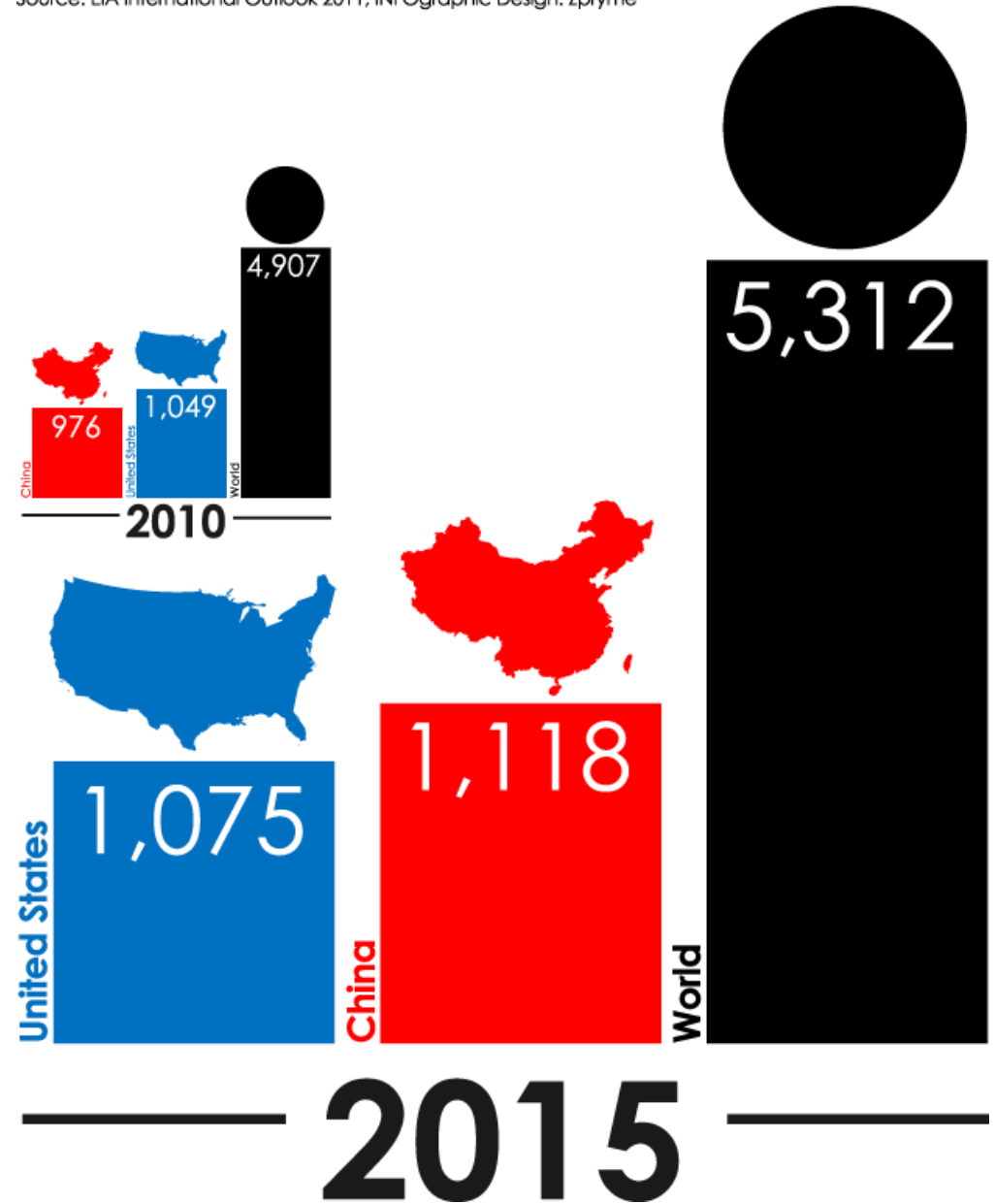
## China's Electricity Profile at a Glance

According to the International Energy Agency's *World Energy Outlook 2011* **by 2015 China will overtake the U.S., and become the leader in total electricity generation capacity.** What's more, by 2035 China will consume nearly 70% more energy than the United States... From phasing out incandescent light bulbs within five years to optimizing the country's clean energy mix, what's extraordinary about China's electricity infrastructure is the speed and scale of its expansion. The solar, wind, coal, hydro, and related renewable technology and generation is galloping at a champions pace, surpassing the U.S. and rest of the world. For example, China has now become the new world leader in wind power, having overtaken the U.S., with 40.2 GW (just three years earlier China's 2020 wind deployment goal was set at 30GW, currently it's a mighty 200GW) while attracting the highest new financial investments for two years in a row with \$49 billion USD in renewables, i.e. about a third of total global investments (since August 2010 China continues to be the most attractive country for renewable investment, followed by U.S., Germany, India and Italy).

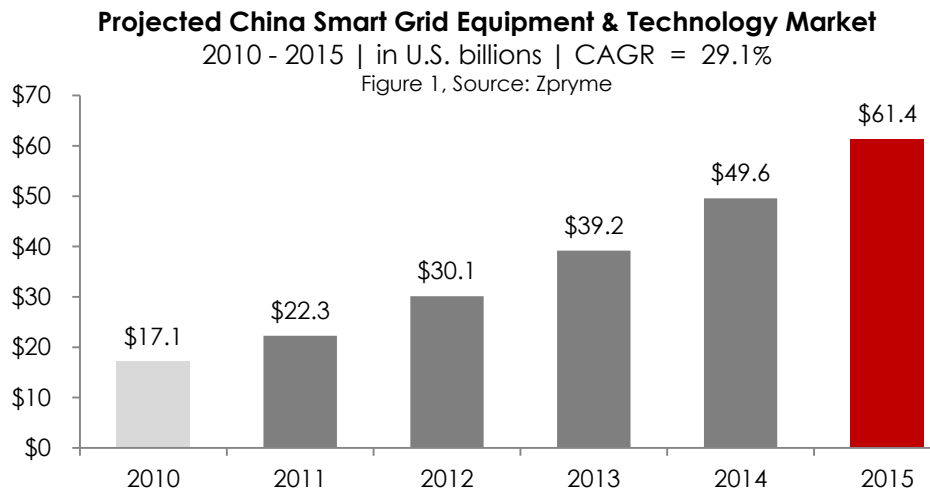
To meet this electricity cocktail, the Chinese government has outlined major plans and dedicated billions to research, design and build a nationwide Smart Grid. Zpryme projects the total value of China's Smart Grid

## Projected Total Generating Capacity (GW)

Source: EIA International Outlook 2011; INFOgraphic Design: Zpryme



market to rise from \$22.3 billion USD in 2011 to \$61.4 billion USD in 2015, an annual growth rate of 29.1 percent over five years (see figure 1).<sup>1</sup>



Driving the Chinese Smart Grid initiative are technologies in spaces such as solar. Since the Chinese government announced the “Golden Sun” initiative in 2009 it's led in solar investment. Still, the Asian nation is starting to feel the dampness of the solar bubble; more recently, losses for China's largest solar manufacturers, including Suntech Power Holdings Co. and JA Solar Holdings Co. may continue through next year.<sup>2</sup>

On the other side of the energy coin, it's no surprise that the world's leading emitter of greenhouse gases still relies overwhelmingly on coal (consuming 3.5 times as much coal as the U.S.). Demand for coal in China could be

muffled next year as domestic electricity producers may pay higher rates to import the fuel to develop power and net generous year over year returns. Not helping the economic energy situation, power providers in China are struggling to recoup their costs as governments restrict prices to curb inflation, reducing the incentive to boost electricity generation from thermal coal. China may have to slow imports of the fuel next year after increasing shipments by about 10 percent this year, according to the China Coal Transport and Distribution Association.<sup>3</sup> To combat this, China is working diligently to build more, but cleaner, coal-fired power plants to meet the demand. The U.S. is also expected to demand more energy, but is starting with a smaller base of coal-fired generation (dissimilar to China, many of the older U.S. coal-fired units are expected to be driven out of the energy pool in the two decades).<sup>4</sup>

## What's Next for China?

On January 18, 2011, the U.S. DOE (Department of Energy) released a report detailing the substantial progress made to date on a number of clean energy initiatives between China and the U.S. Since then, China has been wedged by negative global economic trends; however the China Electricity Council still projects an increase in electricity consumption of 8.5% per year.<sup>5</sup> The Smart Grid coupled with next-gen technologies in spaces such as wind will

<sup>1</sup> Zpryme Smart Grid Insights, China: Rise of the Smart Grid, January 2011.

<sup>2</sup> BusinessWeek, Christopher Martin and Zachary Tracer, China Solar Makers Face 'Suicidal' Prices on Excess Output, November 25, 2011.

<sup>3</sup> www.zpryme.com | www.smartgridresearch.org

<sup>3</sup> Jakarta Globe (originator: Bloomberg), Coal Prices Not Likely to Recover in 2012 As China, India May Limit Purchases, November 27, 2011.

<sup>4</sup> E&E Publishing, Joel Kirkland, U.S. and China strive for fruitful but competitive developments in clean technology, November 29, 2011.

<sup>5</sup> The China Electricity Council said in late October 2011 that China's electricity consumption growth would continue to slow during the rest of this year as the government is making efforts to save energy and cut emission.

offer a unique paradox for a nation that has not even skimmed the surface of both emitting greenhouse gasses and clean-tech preeminence. With Chinese government cooperation, foreign companies that are *quick* to penetrate this market will find that 2012 is the year their brand become *synonymous* with the Smart Grid.

## Key China Electricity Profile Findings

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- From 2010 to 2015, world total electricity generation capacity is projected to increase by 284 GW, from 4,623 GW to 4,907 GW, respectively. During this time period, China will account for 63% (179 GW) of the world's increase in generation capacity. From 2010 to 2035, China is projected to account for 39% of the world's increase in generation capacity.
- By 2015, China will overtake the U.S., and become the leader in total electricity generation capacity.
- By 2035, China will account for a quarter of the world's electricity generation capacity.
- By 2035, China will account for nearly half (49%) of the world's coal fired generation capacity at 1,043 GW.
- By 2015, China will lead the world in the hydro and other renewable electricity generation, accounting for 21% (248 GW) of world capacity. This figure is projected to reach 24% (581 GW) by 2035.
- China's wind generation capacity will grow by 1200% from 2010 to 2035, reaching 533 GW by 2035.

**LEARN MORE:** please see the next several pages for China projection totals on: electric generating capacity, coal, renewable, hydro, wind, and solar.

# China Electricity

## Projections for

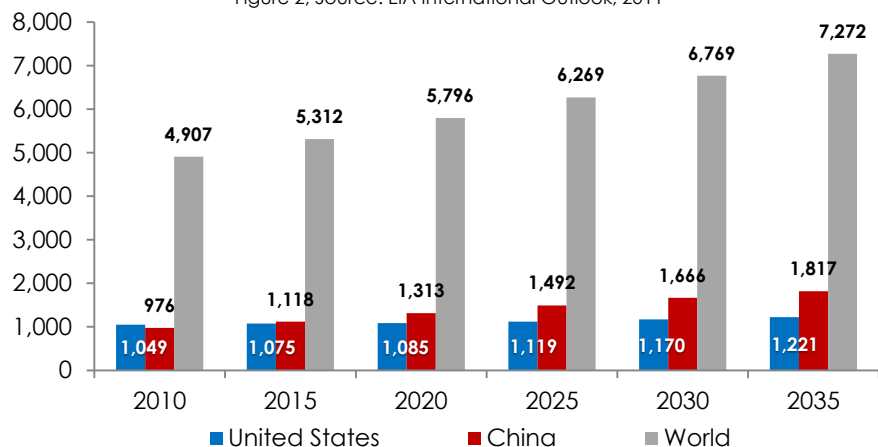
### **Total:**

electric generating  
capacity, coal, renewables,  
hydro, wind, and solar.

## Total Electric Generating Capacity

**Projected Total Generating Capacity (GW)  
2010 - 2035**

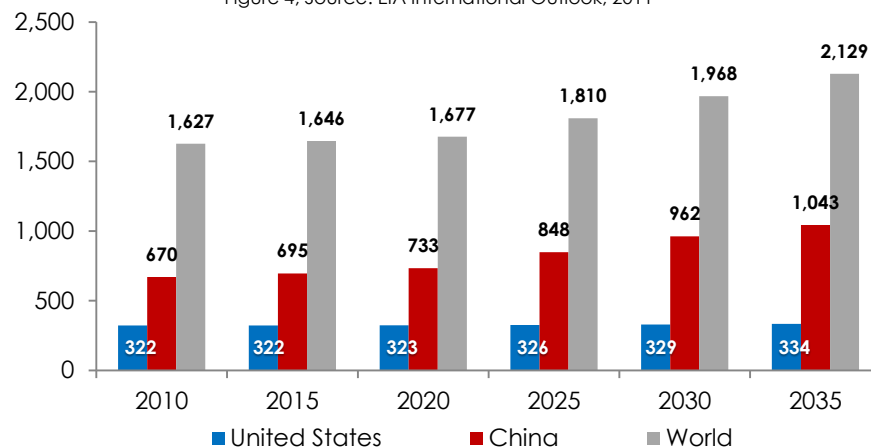
Figure 2, Source: EIA International Outlook, 2011



## Coal Fired Generating Capacity

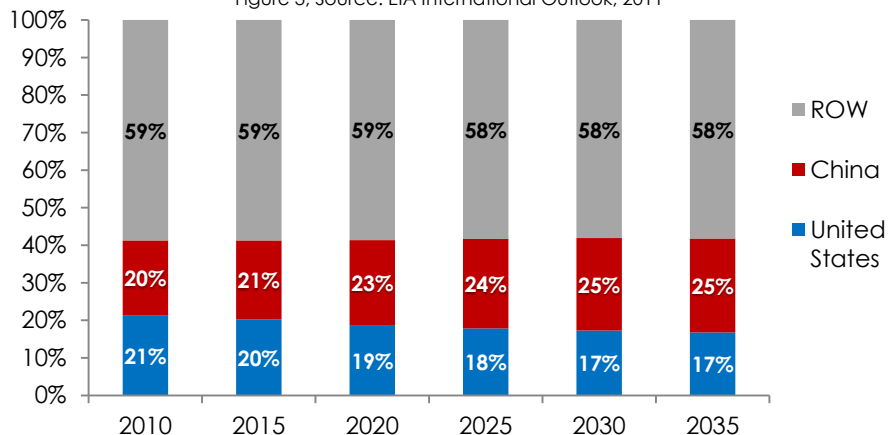
**Projected Coal Fired Generating Capacity (GW)  
2010 - 2035**

Figure 4, Source: EIA International Outlook, 2011



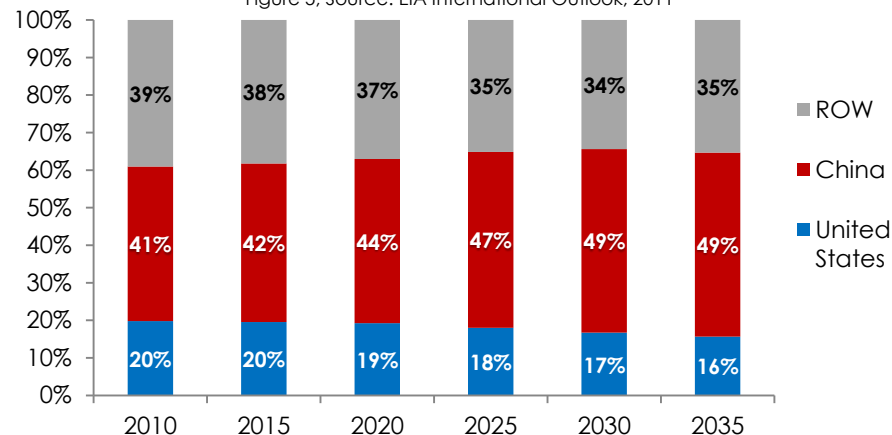
**Percent of World Generating Capacity  
2010 - 2035**

Figure 3, Source: EIA International Outlook, 2011



**Percent of World Coal Generating Capacity  
2010 - 2035**

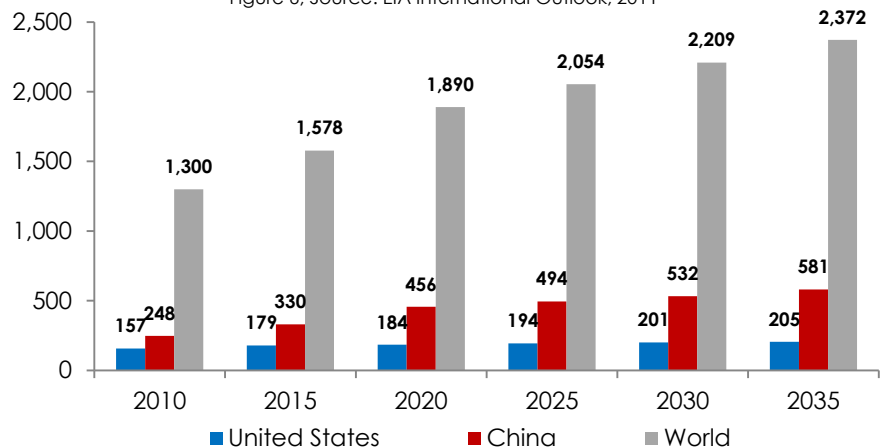
Figure 5, Source: EIA International Outlook, 2011



## Hydro and Other Renewable Generating Capacity

### Projected Renewable Generating Capacity (GW) 2010 - 2035

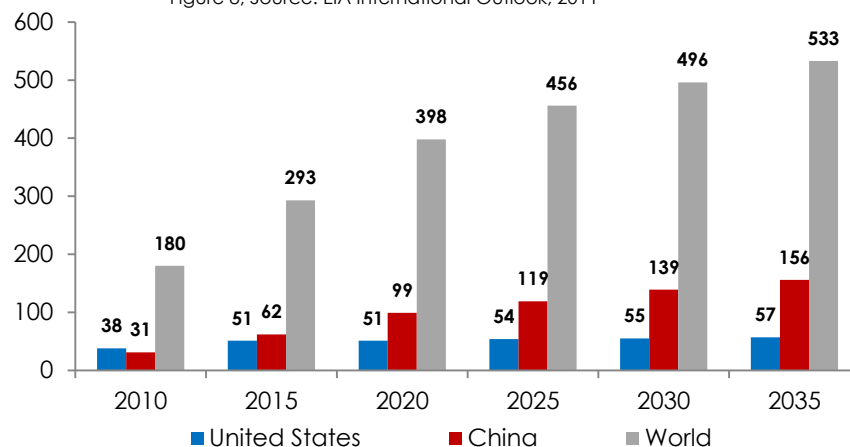
Figure 6, Source: EIA International Outlook, 2011



## Wind Generating Capacity

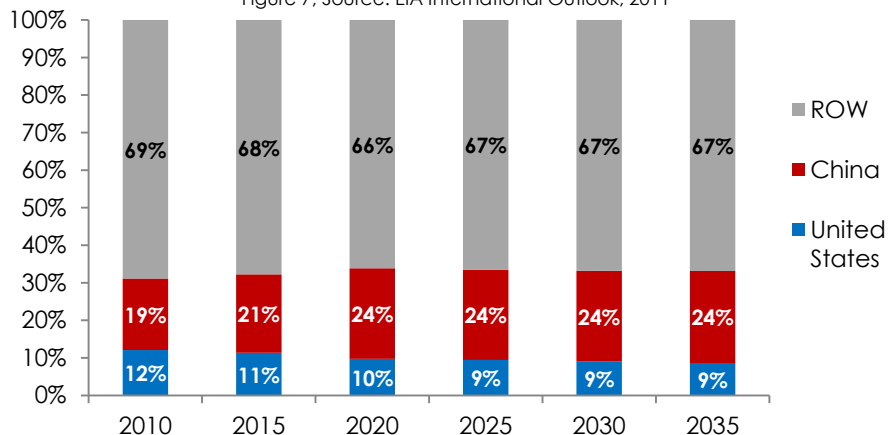
### Projected Wind Generating Capacity (GW) 2010 - 2035

Figure 8, Source: EIA International Outlook, 2011



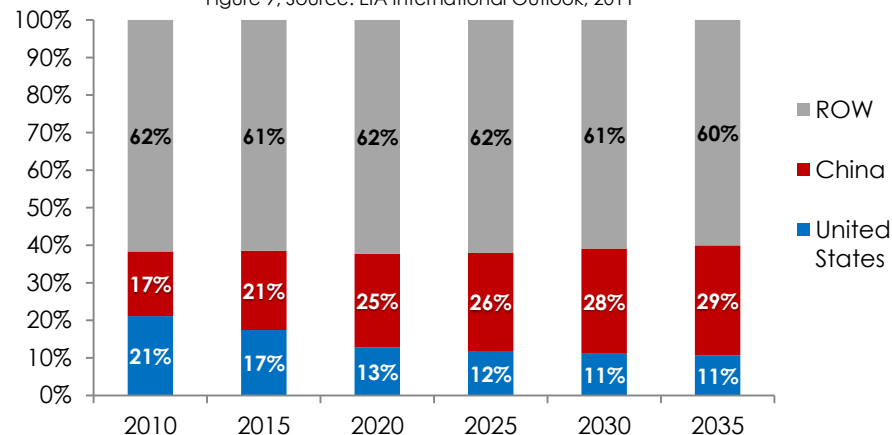
### Percent of Renewable Generating Capacity 2010 - 2035

Figure 7, Source: EIA International Outlook, 2011



### Percent of Wind Generating Capacity 2010 - 2035

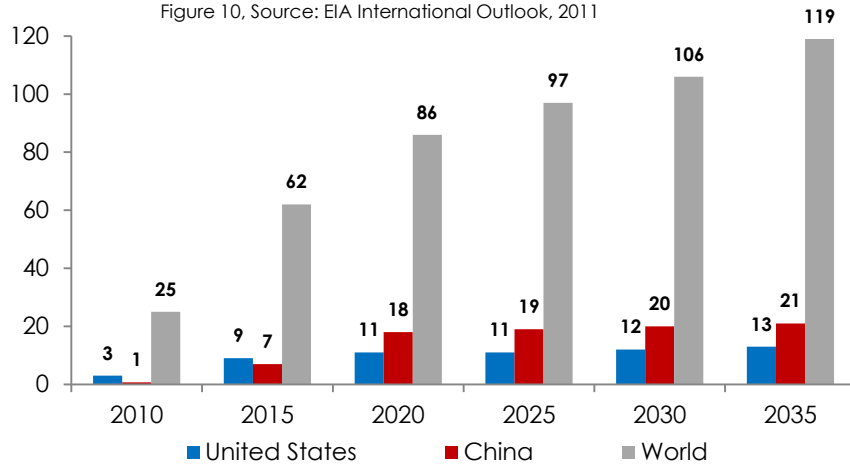
Figure 9, Source: EIA International Outlook, 2011



## Solar Generating Capacity

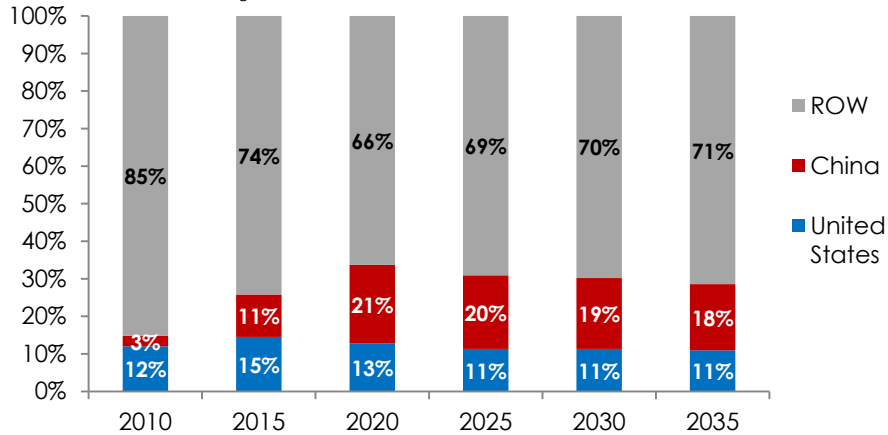
**Projected Solar Generating Capacity (GW)  
2010 - 2035**

Figure 10, Source: EIA International Outlook, 2011



**Percent of Solar Generating Capacity  
2010 - 2035**

Figure 11, Source: EIA International Outlook, 2011



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