Feedback on China Power 2050

--Current Status and Obstacles

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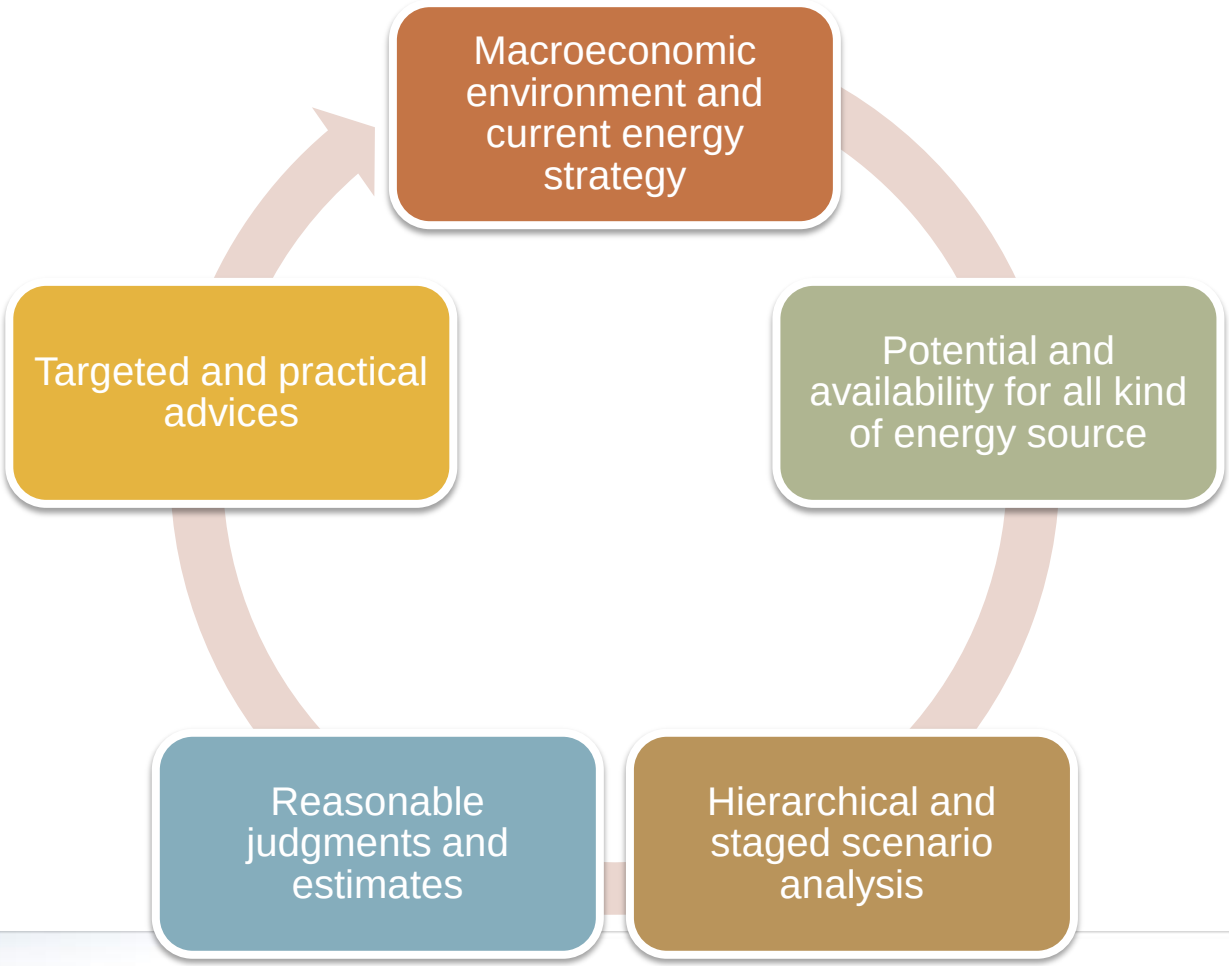
Comments for the Research

- timely and necessary,
- It sends a very positive signal to Chinese policy maker and stakeholders.



About Power Demand in the future

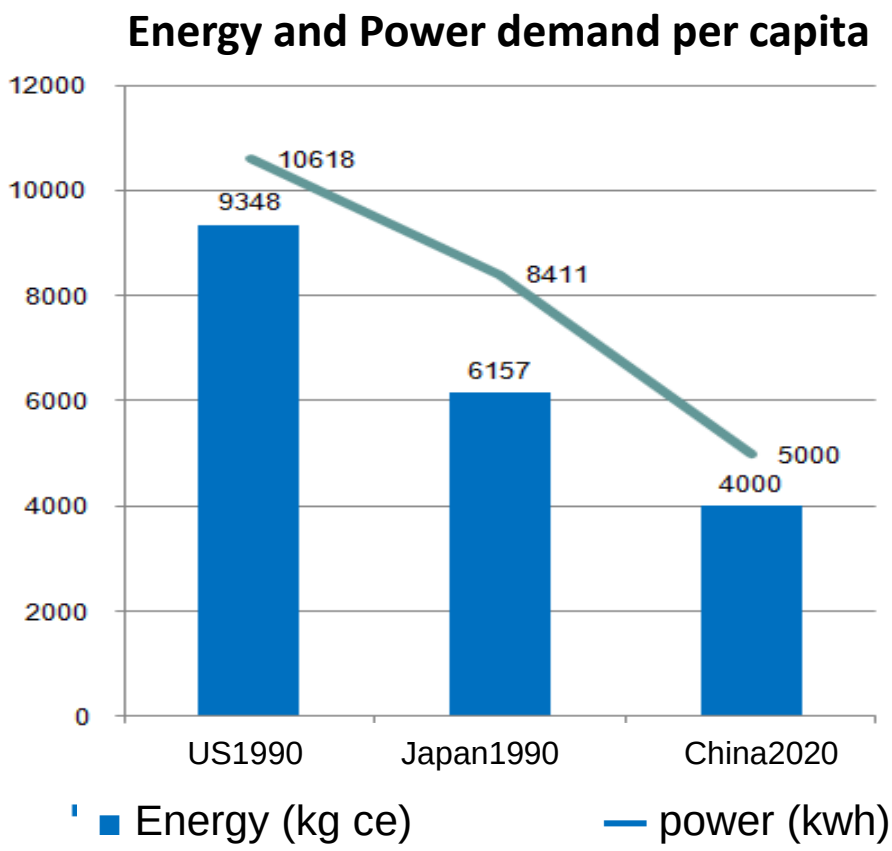
Assumptions:

In the baseline scenario, the project power demand will increase from about 4,000 kWh per capita per year today to more than 17,000 kWh per capita by 2050.

Now the energy conservation and control on the energy consumption have been the fundamental national policies in many countries

China won't stick to the old path, and the electricity consumption per capita would never been the place that is even higher than peak of US

Overestimation on it would lead to exaggerated, unrealistic judgment on development tendency.



Economic competitive in short term and long term

Conclusion:

The renewable energy scenario would be more cost-effective than the scenario that does not prioritize RE and EE.

Current situation:

• Construction cost of solar PV plant is 5 times that of thermal power plant. Hydropower and wind power is twice that of thermal power.

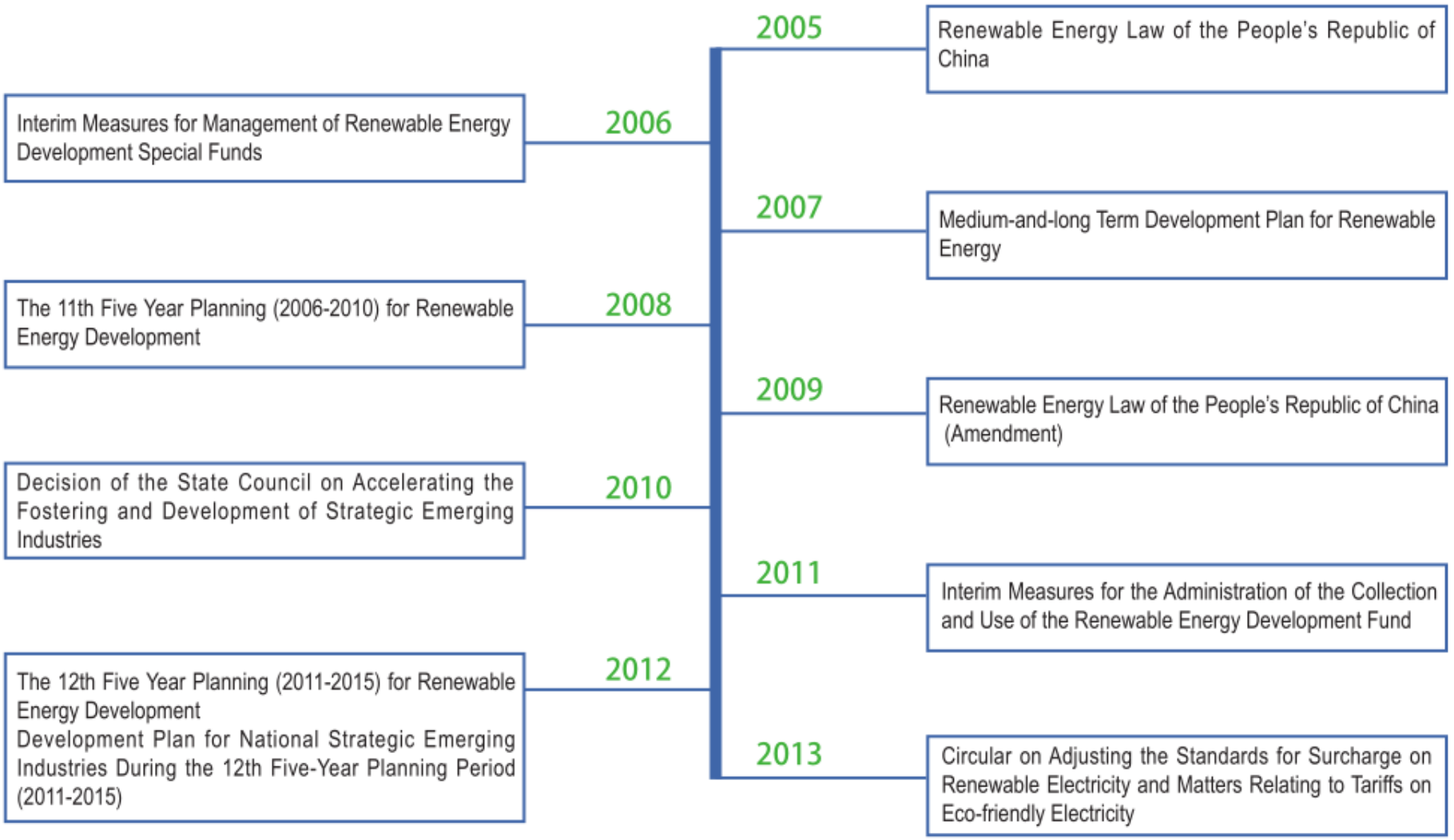
• The subsidy for REs pose a big pressure for finance.

•Capacity factor of the renewable energy is lower, it means we need to install more capacity of RE to replace thermal plant, unclear and gas power, which increase the cost as well.

China Power Construction cost in 2011

Type of technologies	Unit costs (Yuan/KW)	rise
2*30 (10 MW) thermal	4430	-0.29%
2*60 (10 MW) thermal	3622	-1.17%
Hydropower	9600	Rise slightly
Wind power	7300-9000	decreased slightly
Solar PV	13000-28000	significantly reduce

China RE Policy and Targets

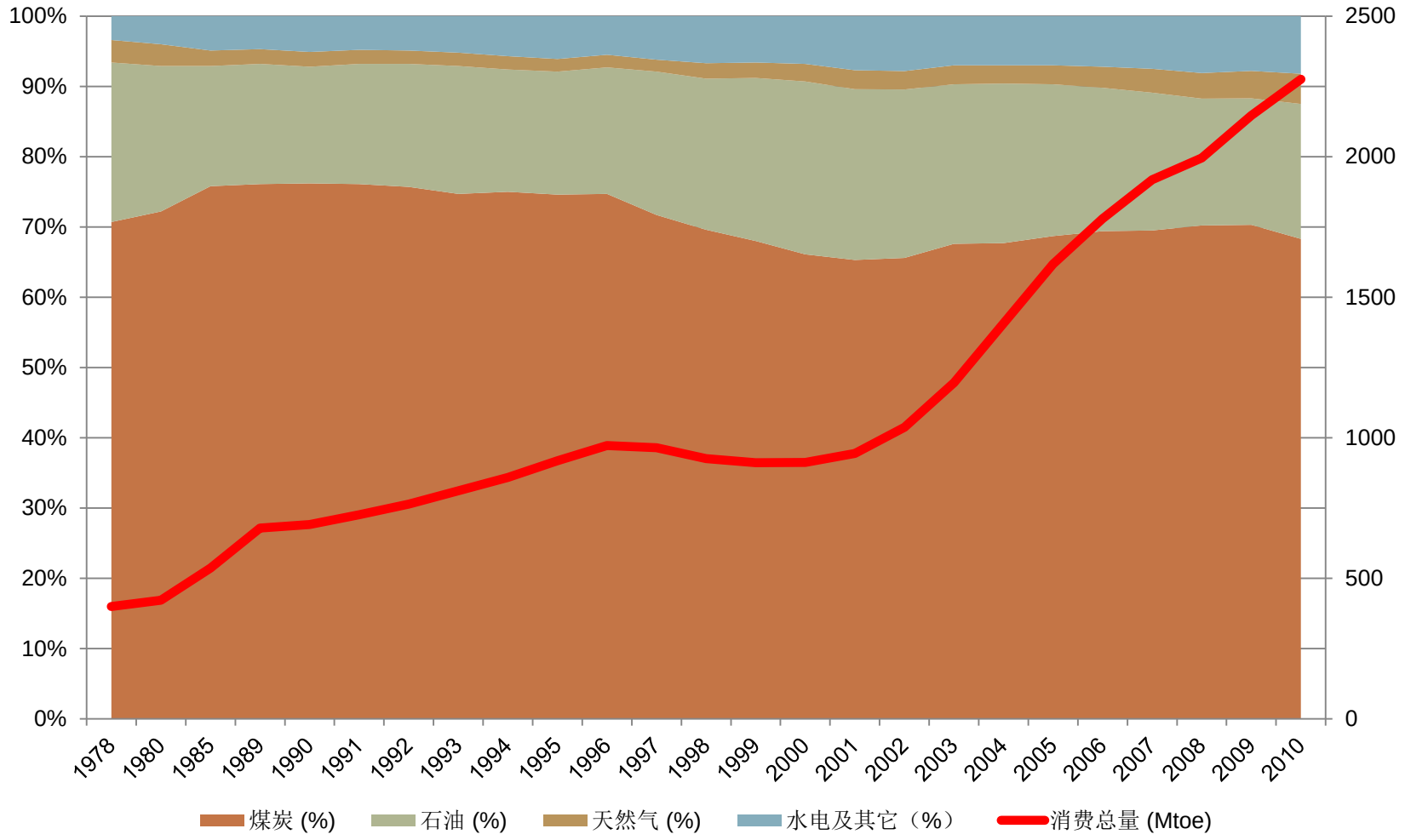


Energy production and consumption in 2013, plan in 2014, 2015

	2013 current situation	2014 target	Target for 2015
Energy production			
Total energy production(billion tce)， growth rate	3.39, ↑2.1%。	3.54， ↑4.3% increase。	4.3,
Coal output(billion tons)， growth rate	2.43, ↑1%;	2.5， ↑2.7%;	3.66 from china
Crude oil output(million tons), growth rate	About 210， ↑ about 2%;	210， ↑0.5%;	
Nature gas output(billion m^3), growth rate	117， ↑ 9%;	131， ↑12%;	
electricity generation(trillion kwh), growth rate	5.35， ↑ 7.5%。		
electricity generation of Non fossil fuel (trillion kwh)	About 1.16	1.3， ↑11.8%。	
Energy consumption			
Total energy consumption(billion tce), growth rate, elasticity coefficient	3.76， ↑3.9%， 0.506，	3.88， ↑3.2%, 0.43;	4 billion tce
Coal consumption(billion tons), growth rate	3.61， 2.7%	3.8， 1.6%;	
Crude oil consumption, growth rate	?， ↑1.7%;	510 million ton， 1.8%;	
Nature gas consumption, growth rate	?， ↑13.9%;	193 billion m3， 14.5%。	
Power consumption (trillion kwh), growth rate, elasticity coefficient	?,↑7.5%, 0.974	5.72， ↑7%； 0.93	6.15 trillion kwh,
Energy consumption per 10,000 Yuan of GDP （tce）	0.737	0.71,↓12%, compared to 2010	↓16% by 2010
Share of non fossil fuel consumption	9.8%， ↑0.4 percentage	10.7%,	11.4%,
Share of nature gas consumption	5.9%	6.5%,	7.5%
Share of coal consumption	65.7%	<65%	65%

Non fossil fuel power capacity			
	2013	2014	2015 targets
Share of Non fossil fuel power capacity	30.9%，↑4%;	32.7%	30%
hydropower	New added 29.93GW，total 280 GW，electricity generation:896 billion kwh、↑5%。	New added 20GW，	Total 270GW
Wind power	New added 14.06GW, total 75.48GW, electricity generation:140 billion kwh, ↑36.4%。	New added 18GW，	Total 100GW
Solar PV	11.30GW, 14.79GW, electricity generation exceed 8 billion kwh, ↑143%	New added 14GW（distributed solar PV take up 60%），	35GW
Bioenergy	Total Biomass power 8.5GW，electricity generation 40 billion kwh	New added 1GW, New added biomass heating 8 million m2, added industry heating 1 million ton tce	13GW
Nuclear power	Total capacity 14.61GW，electricity generation112 billion kwh、↑14%。	New added 8.64GW。	

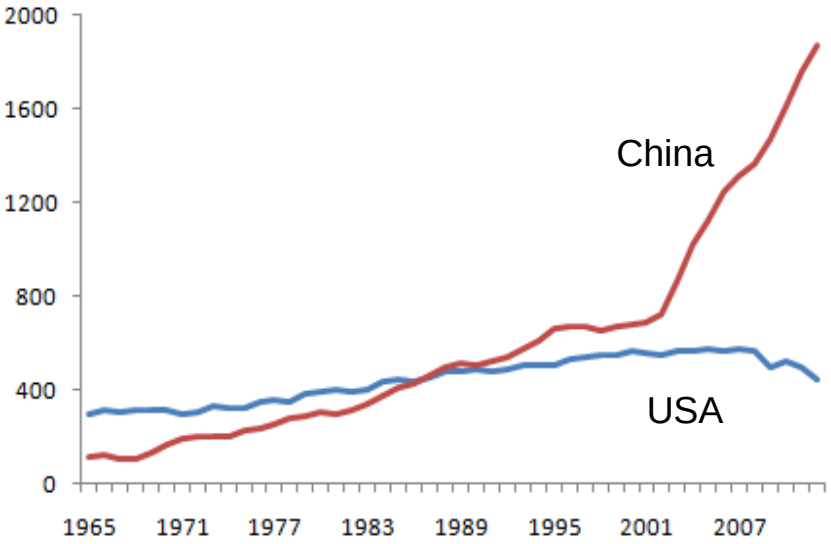
China energy structure and total energy consumption



Coal Elimination

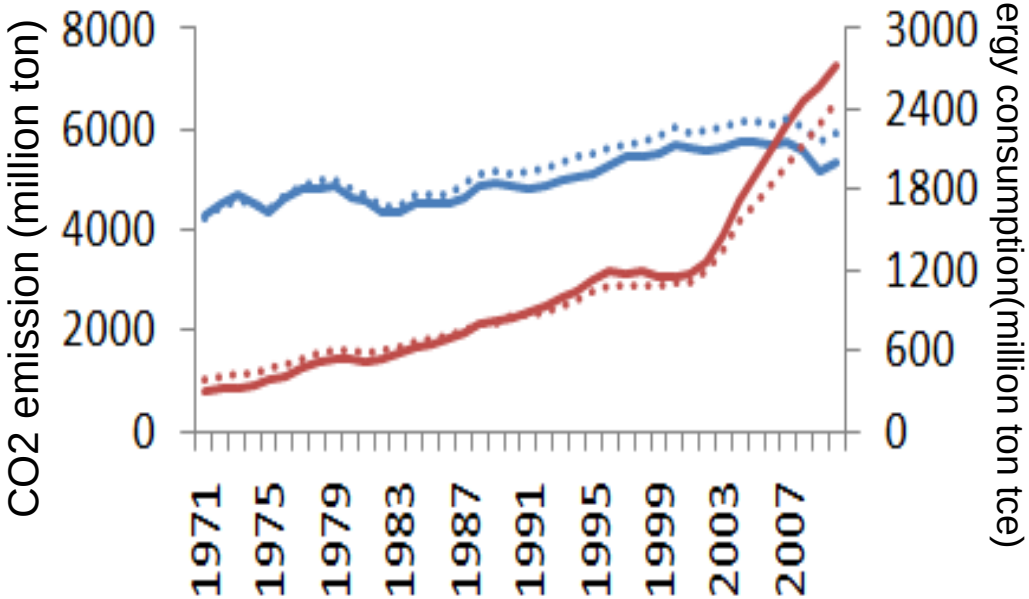
- Eliminate and phase out the coal is the first and significant step for China energy transformation.
- In 2012, energy consumption of China and US come near, GHG emission was 70% higher than US

Coal consumption(million ton tce)



source： BP energy statistic

Coal consumption(million ton tce)



source: IEA

Comparison on research results

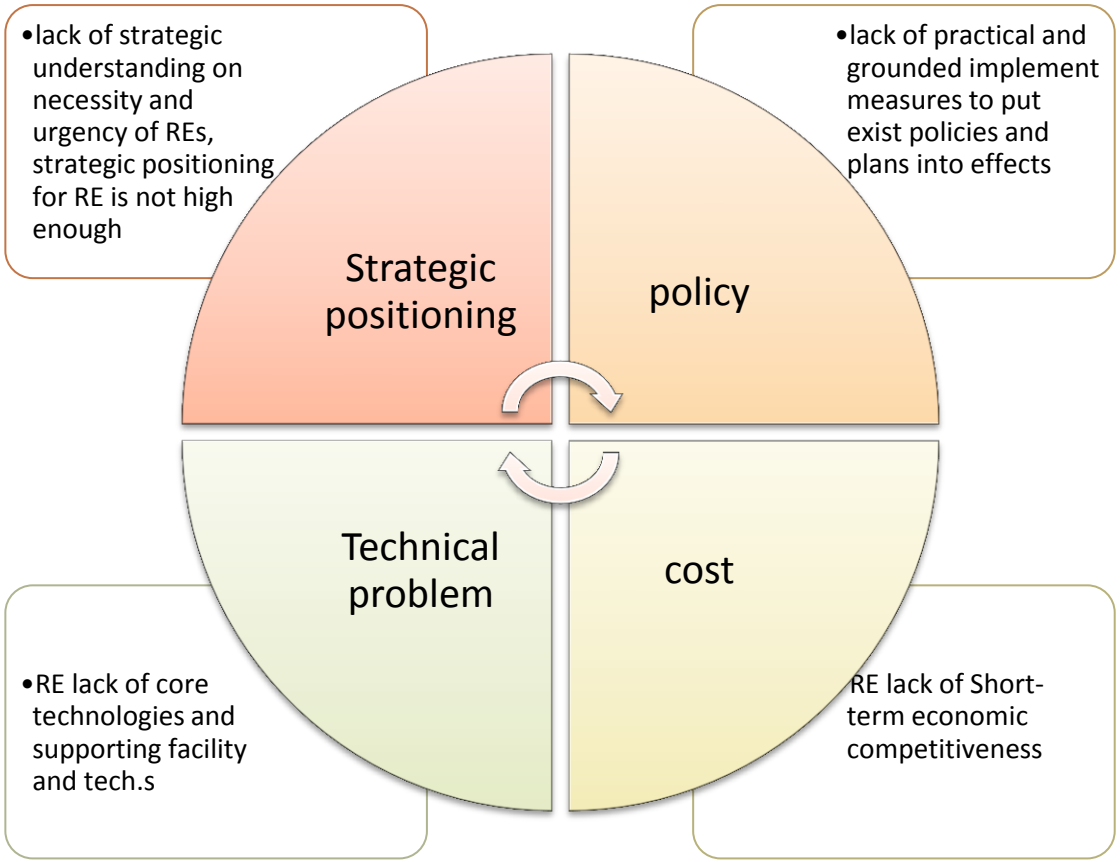
policy maker, research institution and academic institution all lack of strategic understanding on necessity and urgency of the renewable energy development, strategic positioning for renewable energy is not high enough.

2030 scenario	NDRC	DRC	Tsinghua University
Total Energy consumption(billion tce)	6.4	6.8	6.6
Total coal consumption(billion ton)	4.7	4.7	4.4
Share of coal	53%	50%	48%
Share of oil	13%	10%	18%
Share of nature gas	13%	15%	11%
Share of non fossil fuel power	21%	25%	23%

Difficulties and Obstacles

- Impact of EE techs is limited, a change on pattern of economic growth and pattern of consumption will lead to energy transformation. RE techs should play a more important role in cleaning energy mix.

RE's Difficulties



THANKS !

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