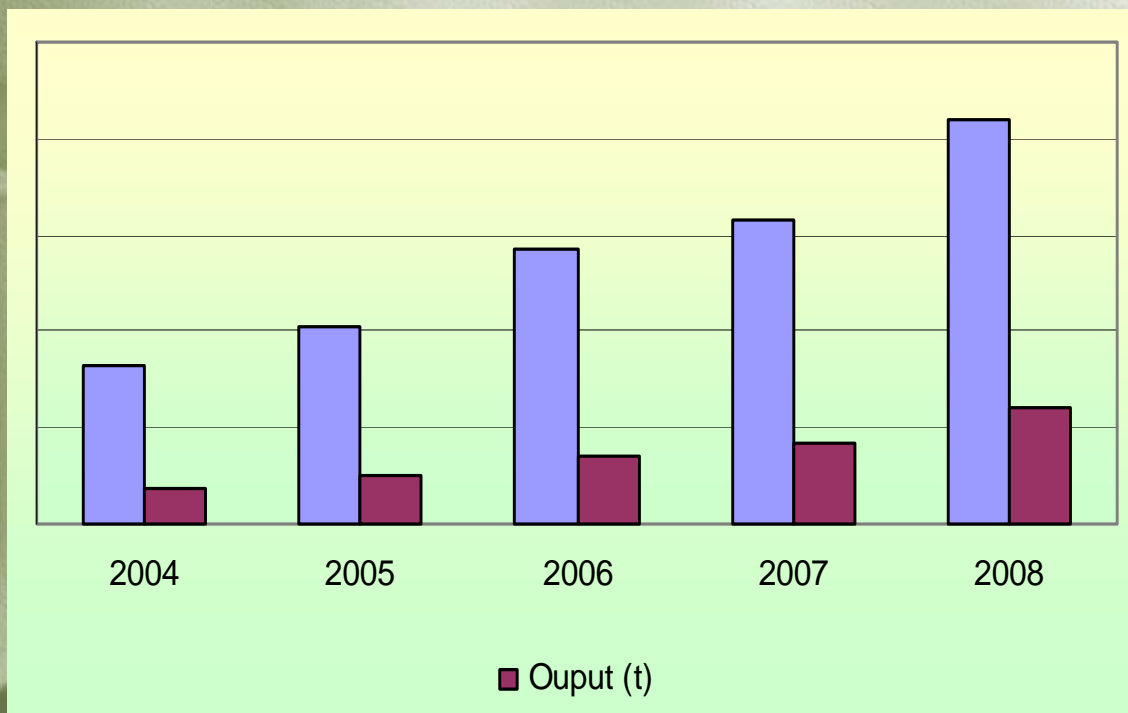


PVP capacity and output in the past 5 years



- The CAGR for capacity and output were about [redacted] and [redacted] respectively in 2004~2008.
- PVP output *grew* faster than its capacity, meaning that operating rate was increasing.

Source: CCM International

- Driven by prosperous pharmaceutical industry, cosmetics industry and office supplies, PVP demand grew rapidly, attracting large investment and capacity expansion in the past few years.
- Many γ -butyrolactone and 2-pyrrolidone producers began to produce PVP to seek higher added value because their original products brought less and less profit due to the intense competition.
- Government support and PVP production localization are another two driven forces for PVP development.

PVP capacity, output and distribution

- Total capacity of ██████ t/a in 2009 and total output of ██████ tonnes in 2008

Distribution of PVP capacity in China



Source: CCM International

Distribution of PVP output in China



Source: CCM International

- PVP production concentrates in Henan and Zhejiang, locations of the earliest researchers: Henan NKY and Zhejiang Chemical Research Institute locate. Even to present, most Chinese producers are associated with these two researchers.

Current active producers

No.	English name	Abbreviation	Location	Launch time	Capacity 2009(t/a)	Output 2008(t)
1			Henan			
2						
3						
4					2,000	
5	Zhejiang Sunflower Technology Development Co., Ltd.					
6						
7				1999		
8						
9						
10						
11						50
12						
13						

Product structure in major active producers

Company Abbr.	PVPK-30		PVPK-90		Others
	Industrial grade	Pharmaceutical grade	Industrial grade	Pharmaceutical grade	
			30%		10%
Henan Meida	20%				
		10%			
				10%	

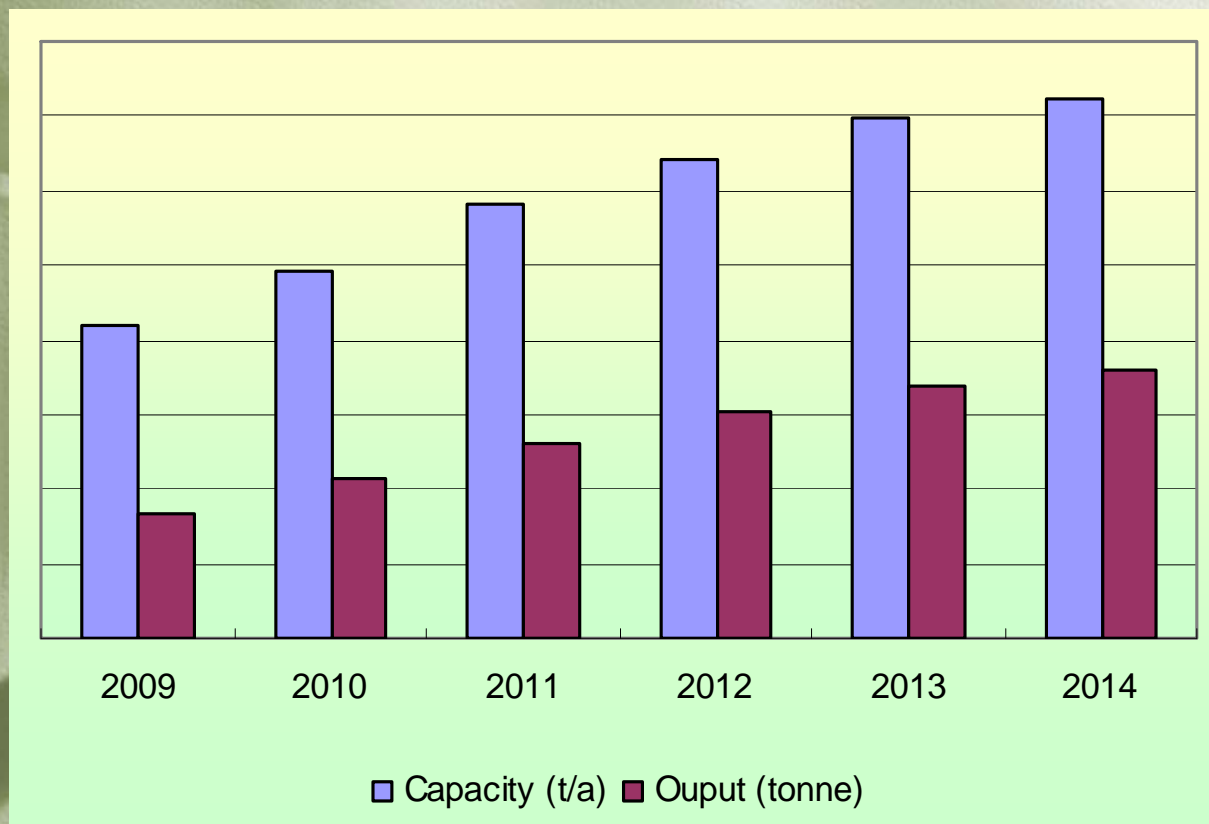
Source: CCM International

- Consumption habit and price difference has led to the PVP product structure.

Comparison among major active PVP producers

Company Abbr.	Strength	Weakness
Henan Yuanhai	Completed industrial chain from BDO to PVP	Relatively smaller scale production

Capacity and output forecast to 2014



Source: CCM International

With increasing domestic and overseas demand, CAGR for PVP capacity and output is estimated to be [REDACTED] and [REDACTED] respectively in 2009~2014, much lower over the past 5 years, but still relatively higher compared with most other chemical products.

Production route application

Company Abbr.	Capacity 2009 (t/a)	NVP route	PVP route	Technology source
Shandong Dongshengxinghua	2,000	Non-acetylene route	Solution polymerization	Guangdong University of Technology

Source: CCM International

- With cheaper and more available raw materials, acetylene route's disadvantages were neglected by the producers when they adopt large-scale PVP production.
- Solution polymerization defeats thermal initiation polymerization, thanks to its absolute advantages.

PVP export situation, by manufacturers, 2008(Volume: tonne, Price: USD/kg)

No.	Manufacturer	Volume	Price
1			
2			
3			
4			6.74
5			
6	Henan Jiaozuo Meida Fine Chemical Co., Ltd.		
7			
8			
9		21.913	
10			
11			
Total			

Source: CCM International



PVP import situation, by importers, 2008 (Volume: tonne, Price: USD/kg)

No.	Importer	Volume	Price
1			
2			
3			
4		64.000	
5			
6			
7			
8			
9			
10	Basf Colorants & Chemicals Co., Ltd.		
11			
12			
13			
14			11.67
15			
	Others		
	Total		

Source: CCM International