

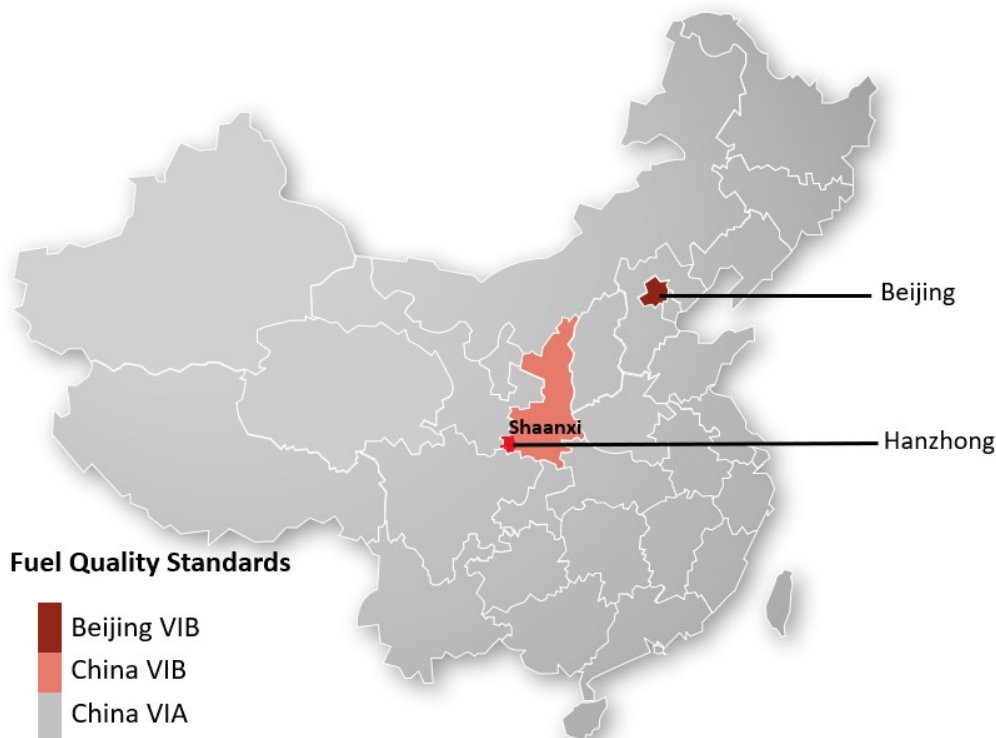
July 11, 2022

Shaanxi Implemented China VIB Standards for Gasoline Ahead of 2023 Deadline

Stratas Advisors

From June 1, 2022, the southwestern province of Shaanxi in China implemented the China VIB standards for gasoline provincewide. This was confirmed in a [press notice](#) jointly published by the [Chenggu County Development and Reform Bureau](#) and the Chenggu branch of the Hanzhong Ecology and Environment Bureau. As shown in the map below, Hanzhong is a prefecture-level city in Shaanxi province comprising of nine counties, with Chenggu County as one of them. The implementation took place ahead of the nationwide requirement of China VIB standards intended for Jan. 1, 2023.

Overview of Fuel Quality Standards by Region as of June 2022



Source: *Stratas Advisors, July 2022*

An official notice titled “Shaanxi 2022 Work Plan for the Defense of Blue Sky, Clear Water, and Pure Land” published by

the Shaanxi government on March 14, 2022 prohibits the production and supply of China VIA gasoline, which has been required nationwide since Jan. 1, 2019. It mandates service stations within the province to begin providing China VIB gasoline six months ahead of the national deadline, serving in part as a test-run for the transition to China VIB standards for gasoline. In addition, starting from Aug. 1, 2022, the retail of gasoline below China VIB standards will be suspended to fully commit to the new standards.

The early implementation comes as Shaanxi's main refinery, Yongping oil refinery operated by the Shaanxi Yanchang Petroleum Group, announced the completion of refinery upgrading and conversion of facilities to produce China VIB standard gasoline since May 12, 2022. It was also followed by the retail of China VIB gasoline at Shaanxi Yanchang's service stations from May 13, 2022.

Key Changes for China VIB Gasoline Standards

Key changes for China VIB gasoline standards include tightening of the limit for olefins to 15 vol% max from 18 vol% (see Reports & Analysis, [July 5, 2016](#)). This limit was set for a later implementation date of January 2023 as some of the refineries in the country were not able to meet the 15 vol% limit by January 2019. The stricter limits of the China VIB gasoline standards come as part of the country's goal towards improving air quality and protecting the environment by reducing emissions.

Current and Future China Gasoline Specifications

	2022	2022	2022	2022	2022	2022	2022 - 2023	2022 - 2023	
Spec Name	GB 17930-2016	GB 22030-2017	GB 17930-2016	GB 22030-2017	GB 22030-2017	GB 17930-2016	GB 17930-2016	GB 22030-2017	C
Grade	89#	89#	92#	92#	95#	95#	98#	98#	9
Grade Category	On-road	Blendstock	On-road	Blendstock	Blendstock	On-road	On-road	Blendstock	Bl
Effective Date	Jan, 2019	Jan, 2019	Jan, 2019	Jan, 2019	Jan, 2019	Jan, 2019	Jan, 2019	Jan, 2019	F
Source	Standardization Administration of the People's Republic of China	Standardization Administration of the People's Republic of China	Standardization Administration of the People's Republic of China	Standardization Administration of the People's Republic of China	Standardization Administration of the People's Republic of China	Standardization Administration of the People's Republic of China	Standardization Administration of the People's Republic of China	Standardization Administration of the People's Republic of China	Star Adm of th Rep Chir
Additional Comments	China VIA	Gasoline blendstock for E10 (China VIA)	China VIA	Gasoline blendstock for E10 (China VIA)	Gasoline blendstock for E10 (China VIA)	China VIA	China VIA / VIB	Gasoline blendstock for E10 (China VIA / VIB)	Gi cc pr m fe
Properties									
RON, min	89	87.0	92	90.0	93.5	95	98	96.5	9
Antiknock index (MON+RON)/2, calculated, min	84	82.5	87	85.5	89.0	90	93	92.0	
Sulfur, ppm, max	10	10	10	10	10	10	10	10	2
Lead, g/l, max	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	C
Manganese, g/l, max	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	

	2022	2022	2022	2022	2022	2022	2022 - 2023	2022 - 2023	
Benzene, vol%, max	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Aromatics, vol%, max	35	38	35	38	38	35	35	38	
Olefins, vol%, max	18	19	18	19	19	18	15	16	1
RVP @ 37.8°C (100°F), kPa, min	40 (s) / 45 (w) (1) (2) (3)	35 (s) / 40 (w) (4) (2)	40 (s) / 45 (w) (1) (2) (3)	35 (s) / 40 (w) (4) (2)	35 (s) / 40 (w) (4) (2)	40 (s) / 45 (w) (1) (2) (3)	40 (s) / 45 (w) (1) (2) (3)	35 (s) / 40 (w) (4) (2)	4
RVP @ 37.8°C (100°F), kPa, max	65 (s) / 85 (w) (1) (2) (3)	58 (s) / 78 (w) (4) (2)	65 (s) / 85 (w) (1) (2) (3)	58 (s) / 78 (w) (4) (2)	58 (s) / 78 (w) (4) (2)	65 (s) / 85 (w) (1) (2) (3)	65 (s) / 85 (w) (1) (2) (3)	58 (s) / 78 (w) (4) (2)	6
Density @ 20°C, kg/m3, min	720	720	720	720	720	720	720	720	7
Density @ 20°C, kg/m3, max	775	772	775	772	772	775	775	772	7
Distillation									
T10, °C, max	70	70	70	70	70	70	70	70	7
T50, °C, max	110	113	110	113	113	110	110	115	1
T90, °C, max	190	190	190	190	190	190	190	190	1
FBP, °C, max	205	205	205	205	205	205	205	205	2
Residue, vol%, max	2	2	2	2	2	2	2	2	:
Oxygen, wt%, max	2.7		2.7			2.7	2.7		2
Oxygenates									
Methanol, vol%	(5)		(5)			(5)	(5)		
Other oxygenates, vol%		(6)		(6)	(6)			(6)	
Iron, g/l, max	0.01	0.010	0.01	0.010	0.010	0.01	0.01	0.010	C
Oxidation stability (Induction period), minutes, min	480	540	480	540	540	480	480	540	
Water and sediment, vol%	None	None	None	None	None	None	None	None	
Water-soluble acid or alkali, vol%	None	None	None	None	None	None	None	None	N
Existent gum (solvent washed), mg/100ml, max	5	5	5	5	5	5	5	5	
Existent gum (solvent unwashed), mg/100ml, max	30 (Z)	30	30 (Z)	30	30	30 (Z)	30 (Z)	30	
Corrosion									

	2022	2022	2022	2022	2022	2022	2022 - 2023	2022 - 2023
Copper corrosion, 3hr @ 50°C, merit (class), max	1	1	1	1	1	1	1	1
Doctor test	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

- (1) Summer - May 1, to Oct 31. Winter - Nov 1 to Apr 30.
- (2) Summer specifications apply to Guangdong and Hainan provinces.
- (3) At the change of seasons, service stations have a 15-day grace period to meet the next season's RVP limit.
- (4) Summer - May 1, to Oct 31. Winter - Nov 1 to Apr 30.
- (5) 0.3 wt% max.
- (6) 0.5 wt% max.
- (7) Prior to the addition of gasoline detergent additives.

Shaanxi Work Plans to Deter Pollution

As part of the official notice, the government of Shaanxi approved three work plans for 2022 namely “Shaanxi Province Work Plan for Blue Sky Defense War”, “Shaanxi Province Work Plan for Clear Water Defense”, and “Shaanxi Province Work Plan for Pure Land Defense War” to support the country’s green initiatives. In particular, the “Shaanxi Blue Sky” work plan is targeted at improving air quality and highlighted several key aspects pertaining to vehicle emissions control and the monitoring of fuel quality to complement the country’s goal of reducing harmful emissions and pollution to the environment.

Main Objective of Shaanxi Blue Sky

Under Section (1), Clause 3, the work plan pledges to tighten pollution control over diesel trucks and non-road mobile machineries (NRMMS) especially focusing on those transporting coal and ores, ensuring that the channels for transportations are less prone to spillage or pollution. This includes reinforcing the development of railroads to pave the way for green transportation. It also highlights the need to reinforce monitoring of on-road vehicles to ensure they meet the current emission standards and to make room for the development of new energy vehicles (NEVs) to support the phasing out of older vehicles. It stipulates the reinforcement of resource-sharing in times of emergency, and for more coordinated actions through the improvement of information sharing mechanism to strengthen law enforcement which adds to the improvement of fuel quality in time.

Promoting and Optimizing Compliance Measures

Next, in Section (7), Clause 17, it reiterates the need to reinforce monitoring of current vehicles, to fully implement vehicle emission inspections and compulsory maintenance system (I/M system), in particular the need to reinforce road inspections for heavy duty vehicles (HDVs). To support the work of monitoring, vehicles are to install pollution control devices and any non-compliance are subjected to acts of enforcements punishable by the Public Security Traffic Control Department, and supervised by the Transport Department. In the case of non-compliance, only after inspection(s) and confirmation that the vehicle is not in violation of emission standards can they resume operation.

Following, Clause 18 highlights the commitment to phase out older diesel vehicles with higher emissions. It is expected that all cities (provinces included) are to develop plans, carry out financial remuneration, limit or impose contingencies to phase out older gasoline and diesel vehicles, notably those whose emissions are equivalent to China III and below. On the other hand, the Guanzhong region (positioned in the center of the Shaanxi province consisting of the following cities: Xi'an, Baoji, Xianyang, Weinan, Tongchuan, and Yangling) is required to promote the use of China IV diesel vehicles and phase out gas-based vehicles using lean burn technology. Vehicle inspection agencies are to oversee the mandatory scrapping of vehicles, and are to register, dismantle and destroy the vehicle(s) according to regulations.

Solidifying Actions Against Pollution by NRMMS

In Section (8), Clause 20 details the control and prevention of pollution by NRMMS. To lower emissions in the NRMMS emission control areas, the government is restricting the use of NRMMS that do not meet China III regulations, which is currently required nationwide (see [China's Emission Standards](#)). Random inspection schedules are expected to take place annually, focusing on verifying the disclosure of test results, compliance to pollution control devices and registry plate/number. Sample pool taken shall not be less than 20% of the registered total. This should aim to eliminate the phenomenon of black smoke from construction machinery.

On the other hand, Clause 21 documents the commitment to promoting cleaner emissions for NRMMS. From Dec. 1, 2022, production, import, and sales of all NRMMS of 560kW and below will be fitted with diesel engines meeting China IV standards. This was also confirmed in the [amendment order of GB 20891-2014](#) published on Dec. 24, 2021. In addition, plans to phase out older NRMMS are to be carried out by the government. This is to promote the elimination of construction machinery with emission standards of China I and below, replacing them with emission standards of China IV and above if conditions permit.

Enhancing Monitoring Capacity

Coupled with compliance measures, the Shaanxi government seeks to enhance oversight on unlicensed and non-compliant service stations to prevent their proliferation as indicated under Section (11), Clause 32. Delegated representatives will be responsible for eradicating unlicensed operation and removal of unlicensed and non-compliant service stations. Investigation on the use of various modified vehicles including those operating without a license and illegal sales of gasoline and diesel for vehicles shall also continue to be strictly carried out.

In addition, Clause 33 aims to strengthen monitoring over petroleum and coal quality to ensure strict implementation of gasoline and diesel quality standards. The Shaanxi government will continue cracking down on the production and sale of substandard petroleum products and low-quality coal, and reinforce the monitoring and inspection of the production and sale of petroleum products and scattered coal distribution points by conducting spot checks. The vapor pressure of gasoline (including ethanol gasoline) shall be the key specification to be inspected during gasoline quality supervision and random inspection. Implementation of increased sampling frequency is expected, with the Provincial Market Supervision Bureau taking the lead, followed closely by the municipal (provincial) governments.

Promoting Clean Energy

Alongside the implementation of China VIB gasoline standards, Section (6), Clause 12 of the Shaanxi Blue Sky work plan also laid out the expectations of minimizing the consumption of coal, and actively seek out renewable energy sources to meet consumer demand. This would allow for the gradual phase out of coal consumption within the province and encourage reliance on renewables instead, which would advance the tightening of fuel quality. By the end of 2022, Shaanxi strives to consume 16.5 billion cubic meters of natural gas and aims for non-fossil energy to account for about 12% of primary energy consumption, while renewable energy stretches to a 40%.

Implementation Status of Beijing VIB

Beijing VIB for gasoline ([DB11/238-2021](#)) and diesel ([DB11/239-2021](#)) has been implemented since Dec. 1, 2021. Since Nov. 30, 2021, two oil depots of Beijing Sales Company and more than 130 self-operated service stations have been replaced with Beijing VIB gasoline and diesel. In addition, in line with the implementation of Beijing VIB, the first batch of 2,500 tons of RON 92 gasoline produced by China National Offshore Oil Corporation (CNOOC) Zhongjie Petrochemical meeting the Beijing VIB standards was introduced to the Beijing market from Dec. 1, 2021. The timely implementation of Beijing VIB came as Beijing sought to host a 'Green Winter Olympics' in 2022 and solidify its role in promoting the reduction of emissions of fine particulate matter (PM2.5) and ozone.

Stratas Advisors' Views

With Shaanxi as the first province to implement China VIB gasoline standards, it sets precedence for China and other provinces (excluding Beijing) as a whole. The completion of the refinery upgrading played a vital role in the implementation of the new gasoline standards ahead of schedule. Shaanxi is expected to yield sufficient supply of China VIB gasoline as it was reported that the three refineries affiliated to Yanchang Petroleum Group and PetroChina Changqing Petrochemical Company have successfully completed upgrading their facilities to produce China VIB gasoline. Moving forward, China VIB is set for Jan. 1, 2023.