Play: Sichuan Longmaxi Shale Play
Geological Province: Sichuan Basin
Country: China

**Definition and Distribution**

The black graptolite shales of the Lower Silurian Longmaxi Formation, deposited in still water and anoxic environment, form excellent hydrocarbon source rocks. The Formation is mainly developed in the south and east and absent in western-central part of the Sichuan Basin (Fig. 1).

![Map showing distribution of Lower Silurian Longmaxi Shale Gas Play, Greater Sichuan Basin, China.](image)

Fig.1. Map showing distribution of Lower Silurian Longmaxi Shale Gas Play, Greater Sichuan Basin, China.

The Longmaxi Formation consists of a lower section of black graptolite shales and sandy shales, whereas the middle and upper sections of the formation are dominated by greyish-green shales and sandy shales. The black shales of the lower section, characterized by high abundance of organic matter, large thickness, good kerogen type and high maturity, are the main target for shale gas exploration.
Fig. 2. Generalized stratigraphy of greater Sichuan Basin, China.
Maturity and Gas Resource

The Total Organic Carbon (TOC) content of the Longmaxi black shale varies between 1.2% and 8.65%. The Changxin 1 well, drilled in Changning-Hongxian area, had taken 150 m core from the lower section of the Longmaxi Formation (Fig. 4). Based on core analysis the TOC content for the upper 110 m core ranges between 1% to 3% with an average of 2%; while from 110 - 153
In the core interval, the TOC contents are all greater than 2%, with averages up to 6%. The total core interval thickness with TOC greater than 2.0% is up to 80 m, mainly distributed in the lower section of the Longmaxi Formation (Wang et al., 2009).

![Graph showing geochemistry data for Longmaxi black shales from Changxin 1 well](image)

**Fig. 4.** Geochemistry of the core sample of the Longmaxi black shales from Changxin 1 well (after Wang et al., 2009).

The organic matter are mainly Type I - II kerogen, with Vitrinite Reflectance (Ro) ranging from 2.0% to 3.6%, the highest of 4%, indicating that these shales had attained thermally mature to over-mature stage (Fan et al., 2006). A preliminary total Gas-in-place (P50) of 1,635 Tcf is estimated for the Longmaxi Shale Gas Play.

**Reference:**

