The coal seam interburden, as a viable methane source, has not yet been well researched or developed compared to that of sandstone, coal or shale.

This project aims to characterise interburden and develop a novel stimulation method to effectively crack this thick but malleable layer. The objectives regarding this project are:

1. Experimentally measure the coal seam interburden properties relevant to gas development
2. Develop pulse arc electrohydraulic discharge (PAED) and employ it to stimulate interburden samples
3. Investigate the mechanisms of interburden breakage.

Preliminary tests were carried out with a comprehensive characterisation system using SEM/EDS, XRD, mechanical test, isothermal adsorption, mercury & helium tests, etc. Part of the results are reported as follows:

Fig. 4 shows the interburden has a centralised pore volume distribution and the mesopore is the dominant pore. This is favourable for gas storage and adsorption.

Fig. 5 shows the compressive strength of interburden is around 28 MPa, which will be taken into consideration during PAED design.

Fig. 6 shows the isothermal adsorption capacity of the tested interburden. Based on comparison with coal samples from the Surat Basin (Fig. 7), the adsorption capacity of the interburden is around 20% that of coal. This indicates interburden has promising potential for gas development as the interburden layer has greater thickness than the coal layer.

The rationale of PAED stimulation is to convert a proportion of the electricity into mechanical force to crack the interburden.

1. Advancement of knowledge regarding coal seam interburden, in particular of the properties related to gas development, to exploit this added gas resource.
2. Development and employment of an innovative stimulation technique, i.e., pulse arc electrohydraulic discharge (PAED), for interburden stimulation.

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