

ENVIRONMENTAL AND ENERGY COST ADVANTAGES OF OIL SHALE FUELED CAPTIVE POWER PLANTS WITH ASH UTILIZATION AT CEMENT INDUSTRIES, LOCATED IN COUNTRIES WITH HIGH CO<sub>2</sub> BASELINES

Dr. Tamer TURNA

TES Ltd., Shareholder, A.Dudullu Mah., Sinpas Yolu, Sener Sk. 26/3, 34773, Ümraniye - Istanbul, Turkey, tamer.turna@gmail.com

Oil shale's can provide an attractive fuel alternative for to both direct combustion in cement kilns, as well as CFB (circulating fluidized bed) technology based captive type thermal power plants.

Oil shale's containing limestone do further provide an interesting basis to bind their sulfur content during combustion and gypsum is being produced and remains in the ashes. This levels the value of such ashes, as a raw material and as an additive to the cement production process, while reducing SO<sub>x</sub> emissions below limit values.

Thanks low combustion temperatures of 800 - 950 °C, NO<sub>x</sub> emissions are also kept below limit values.

Further, due to substitution of a certain amount of clinker and subject to the base line of the implemented country, a reduction of CO<sub>2</sub> emissions can also be achieved, thus an additional income stream (via CER's and VER's) can be structured and generated.

Oil shale's utilized at CFB technology based thermal power plants can generate cost effective power and provide independence from the grid. The power output of such plants can be sized in relation of the power demands of the cement production facility (15 - 100 MWe). The bottom ash and fly ash of the CFB boiler, can be sent to the kilns or cement mills. The CO<sub>2</sub> emission reduction can reach 150.000 to 1.500.000 Tons/Year, depending on the type of cement produced.