

USAGE OF MINERAL WASTE OIL AS ALTERNATIVE FUEL FOR SUSTAINABLE ENERGY IN THE CEMENT SECTOR

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ABSTRACT

Energy needs are increasingly growing due to the mechanization of industry by the industrial revolution, increased production in line with increased population, higher prosperity levels, and abundance of electrical tools. Mineral oil get polluted chemically and physically and become unusable after a certain amount of usage. As natural resources are limited, mineral waste oil need to be recycled in order to reduce production costs and achieve sustainable energy acquisition. Cement factories are energy-intensive businesses and among industries that have the highest needs for energy. With usage of mineral waste oil as alternative fuels for cement production, these oil will be recycled back as energy and the waste will also be eliminated. This usage also reduces the consumption of non-renewable resources and prevents rapid degradation of natural resources. The purpose of this study is to present the usage of waste mineral oil in practice for sustainable energy in the cement sector.

Keywords: Waste oil, cement, clinker, sustainable energy, recycling

INTRODUCTION

The Industrial Revolution emerged between 1760 and 1830 as a result of mechanization of textile looms in England. Increase in the power of motion by usage of coal and steam brought mechanization and manufacturing into factories. The Industrial revolution, after a light industry like textile that does not require much capital, also affected heavy industries with consecutive technological advancements and increases in the knowledge base on manufacturing.

Industrialization in Turkey started in the first days of the Republic almost entirely pioneered by the state. The industrialization process in Turkey got fasted by added participation of the private sector. One of the most important factors of establishment for industry is energy. Considering the primary energy consumption in Turkey, this was 7.8 million tons of oil equivalent (mteo) in 1965, while it reached up to 131.3 mteo in 2015 by a 1,583.3% increase. 85.6% of the primary energy consumption in Turkey was satisfied by fossil fuels [1].

Year	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015
Natural Gas	0	0	0	0	~0	3.0	6.1	13.1	24.2	35.1	39.2
Coal	3.7	4.7	5.9	7.0	12.0	16.1	16.6	22.9	22.5	31.4	34.4
Oil	3.6	7.1	12.5	15.4	17.8	22.9	29.0	31.0	30.7	31.8	38.8
Hydraulic	0.5	0.7	0.8	2.6	2.7	5.2	8.0	7.0	9.0	11.7	15.1
Renewable	~0	~0	~0	~0	~0	~0	0.1	0.1	0.1	0.9	3.8
Total	7.8	12.5	19.8	25.0	32.6	47.3	59.8	74.1	86.4	111.0	131.3