MAY 2020

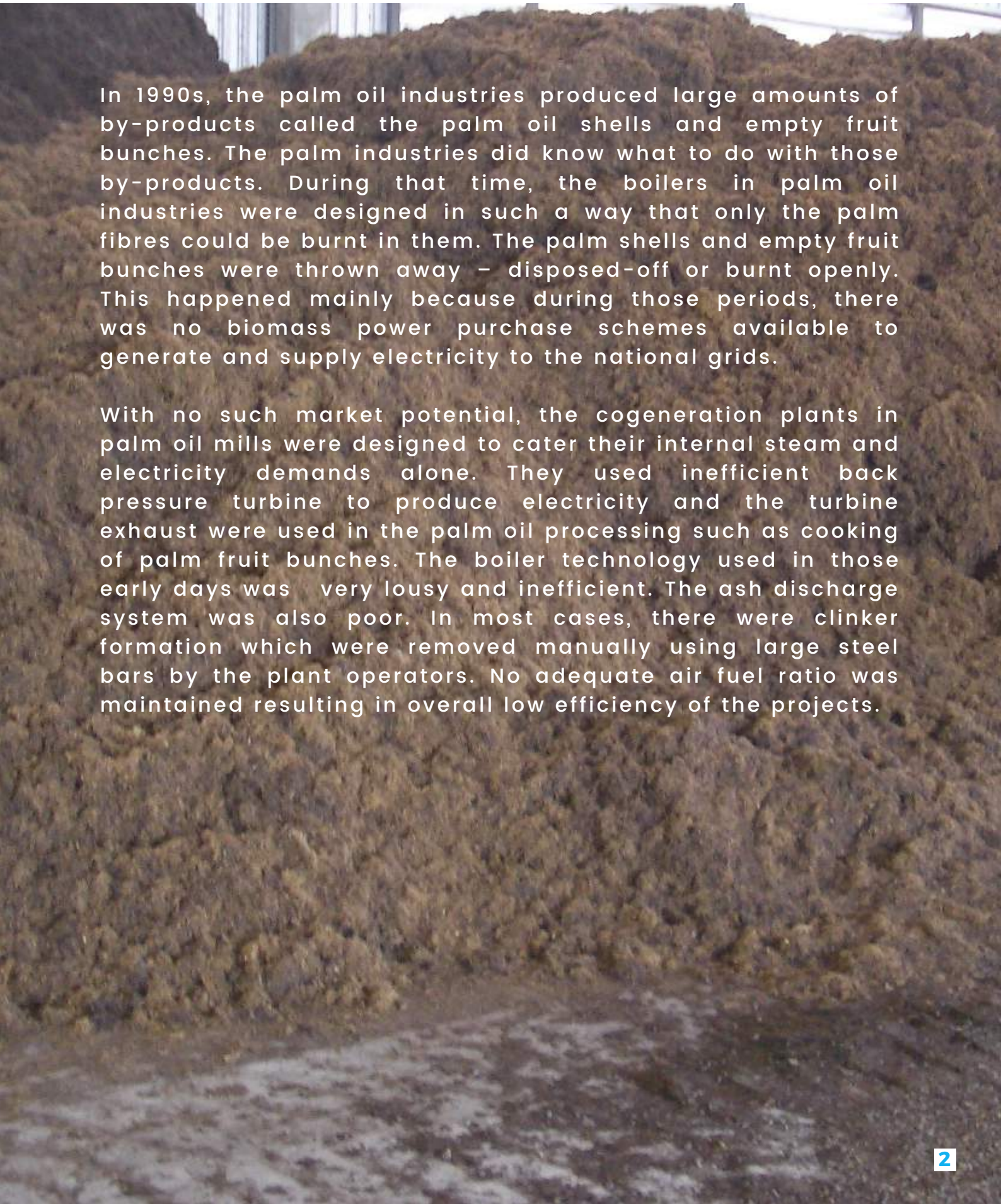

# MODERN PALM OIL MILL WASTE COGENERATION PLANT DEVELOPMENT IN MALAYSIA

## CASE STUDY/INSIGHT



E2020-05-01

# MODERN PALM OIL MILL WASTE COGENERATION PLANT DEVELOPMENT IN MALAYSIA



In 1990s, the palm oil industries produced large amounts of by-products called the palm oil shells and empty fruit bunches. The palm industries did know what to do with those by-products. During that time, the boilers in palm oil industries were designed in such a way that only the palm fibres could be burnt in them. The palm shells and empty fruit bunches were thrown away – disposed-off or burnt openly. This happened mainly because during those periods, there was no biomass power purchase schemes available to generate and supply electricity to the national grids.

With no such market potential, the cogeneration plants in palm oil mills were designed to cater their internal steam and electricity demands alone. They used inefficient back pressure turbine to produce electricity and the turbine exhaust were used in the palm oil processing such as cooking of palm fruit bunches. The boiler technology used in those early days was  very lousy and inefficient. The ash discharge system was also poor. In most cases, there were clinker formation which were removed manually using large steel bars by the plant operators. No adequate air fuel ratio was maintained resulting in overall low efficiency of the projects.

# MODERN PALM OIL MILL WASTE COGENERATION PLANT DEVELOPMENT IN MALAYSIA

However, the palm industries were not worried about these issues because if they do not get rid of those palm fibre wastes within their boiler then palm industry owners have to face another problem i.e., transporting and disposing those wastes which is a costly affair. So the palm industry owners were comfortable in using the old boilers like waste incinerators.

We visited several such palm oil industries, power plants, cogeneration plants in Malaysia. During 1990s, in most of these plants, palm shells were simply dumped on access roads as road materials especially, during rainy season. The dumped wastes on access roads helped the trucks to easily pass and return back from the palm oil industries. So poor was the market value for the palm shells.

Later, the European Commission (EC) - Association of South East Asian Nations (ASEAN) Cogen program was introduced. Under the program, awareness was created among the palm oil industries to go for modern power plants and the boilers were manufactured with European technologies. The program studied the application of the appropriate boiler design to cater to needs of the palm industry. Several testing and researches were carried out in utilizing the palm shells and empty fruit bunches. The modern and efficient biomass power plants were developed to use all kinds of wastes from palm oil processing, i.e., fibres, empty fruit bunches and shells.

# MODERN PALM OIL MILL WASTE COGENERATION PLANT DEVELOPMENT IN MALAYSIA

After several such project demonstrations, today the palm oil industry is self-sufficient and is able to use all the waste generated within the industry complex to generate electricity over and above its internal requirement and export to the national grid. This is an excellent example of how the modern technology changed the entire power generation concepts and scenarios in the palm oil sector in Malaysia. After the success of the technology, it was widely accepted and replicated in Thailand, Indonesia and several other Southeast Asian countries as well.