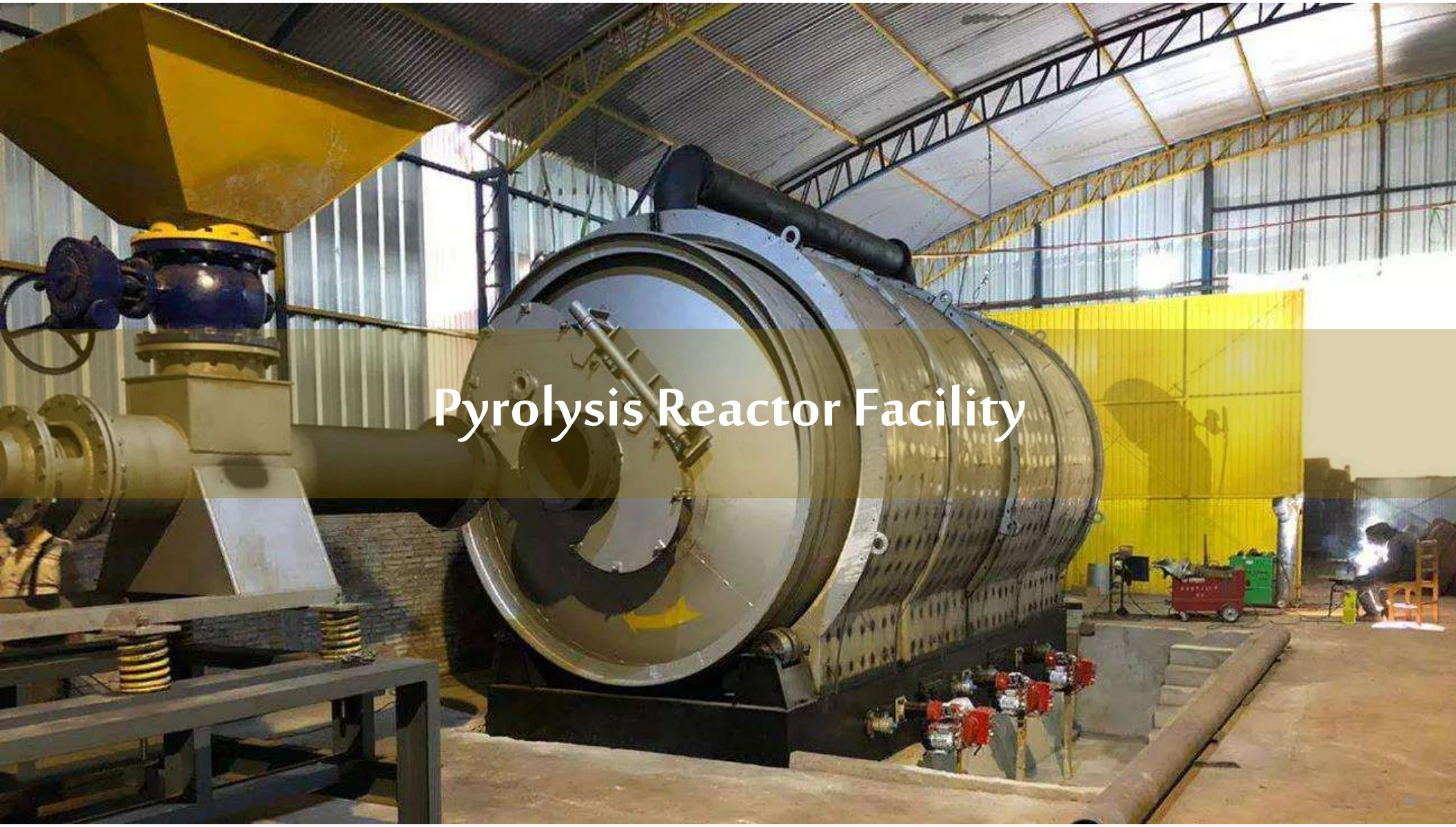
Industrial Investment Opportunities


Pyrolysis Reactor Facility

UNITED ARAB EMIRATES
MINISTRY OF INDUSTRY
& ADVANCED TECHNOLOGY

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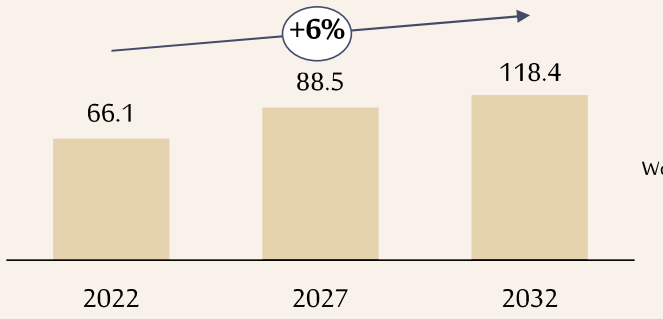
Pyrolysis Reactor Facility

Facility to streamline the "waste to energy" recycling process by including both "pre-treatment" and "pyrolysis" activities producing Recycled Polymer Feed (RFP) to be fed to either the existing "Naphtha" or "Fluid Catalytic" Cracker in the UAE

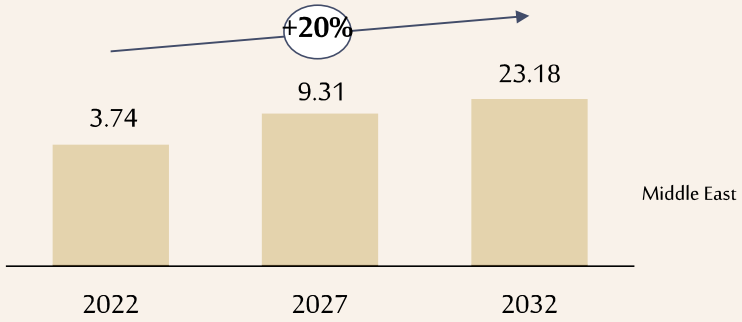
Investment case

- Setup a Pyrolysis Reactor Facility in the UAE
- Investment size = AED 126.6 Mn
- Plant capacity = 40,000T per year
- Expected IRR = 11%
- Expected NPV = AED 15.43 Mn

Global Market Size 2022 – 2032 (Bn AED)



Regional Market Size 2022 – 2032 (Bn AED)



Global trends & demand drivers

- Lower greenhouse emissions: Make use of UAE plastic disposal in landfills which drives value through recycling and creates new jobs as recycled content of packaging materials increases.
- Climate Change: Plans of imposing taxes on carbon emissions due to the impact of climate change. Using RPF can reduce the carbon footprint in the production of petrochemicals.
- Demand for petrochemicals: RFP can be used to create energy. Energy is needed in the production of Petrochemicals. Petrochemicals are set to account for more than a third of the growth in world oil demand by 2030.
- Introduction of regulatory frameworks for use of RPF will create the necessary environment for its adoption in oil refineries.

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Value Chain Analysis

Waste Collection and Sorting	Sorting and Separation	Pyrolysis	Recycled Polymer Feed (RPF)	Feed to Naphtha Cracker or FCC
• ~1.5 MT/yr of post-consumer plastic waste generated in the UAE • Local stakeholders play an integral part in the collection of waste in the UAE. • Every 1 ton of waste generated in the UAE is made up of 25% plastic.	• Waste management companies are working to build the necessary infrastructure. • Educating + increasing awareness are currently underway to help provide necessary feedstock.	• Mixed Plastic Waste (MPW) of specific quality into direct contact with molten zinc. • At 450 C, MPW pyrolyzes into hydrocarbon vapors, gases, and solids where Vapors are then condensed to P-oil.	• The product from a plastic pyrolysis process, has high economic value. • Could be sold to an oil refinery, a fuel blender, upgraded to diesel, wax or other petroleum products.	• *FCC -Ruwais:* Can be processed by ADNOC refinery. RFP is used to make propylene, green gasoline, and green propylene. • *Borouge Naphtha Cracker*: an additional layer of investment needed by Borouge to process RFP.

High localization in UAE | Mid localization in UAE | Limited localization in UAE

Value proposition

Phase 1	• Capture 40kt/yr of plastic grade feedstock • 40 kt/yr needed at a pre-treatment level • Extract ~30kt/year for reactor inlet @ 75% conversion • Reactor feedstock will be converted to RPF at approximately 85% conversion, yielding 25 kt/yr
Phase 2	• ~45% of unutilized Feedstock unlocked • Laws & regulations limiting exports and legalizing recycling • Additional capacity available for recycling
Long-Term: (+5years)	• ~65% of unutilized Feedstock unlocked • Sourcing and sorting infrastructure of local waste will increase feedstock availability

Enabling Entities

- **TAZIZ:** Upstream and Downstream anchors are situated in Taziz which creates a suitable ecosystem for a Pyrolysis facility
- **Khalifa Port:** Facilitates companies exporting revenue stream and helps position it as a regional and international player
- **EDB:** Competitive debt pricing will help lower WACC and in return improve Internal Rate of Return and pay back period
- **MoIAT:** Help source the required feedstock of quality grade plastics to be used as input for facility