

EXECUTIVE SUMMARY

REACTIVE ENERGY, INC.

“Clean Synthetic Petroleum Base Products from Waste Plastics”

Summary Statement: Reactive Energy, Inc. (REI) is commercializing proprietary technology that convert low value hydrocarbons into high valued refined synthetic petroleum base products. The company will assist in building and developing facilities and act as licensor/franchisor for third-party implementation of the process. The company has improved the technology and its knowhow for the development of fully automated facilities. REI will build, license, provide technical structure and training for licensed parties with a shared profit buyback arrangement for its produced product.

Technology Overview: The REI process utilizes microwave activated chemistry to molecularly disrupt (gasification) hydrocarbons to be then restructured into other forms of hydrocarbons. The commercial value proposition is the process to convert low value hydrocarbons – such as waste plastics – into high value synthetic petroleum products including slack wax, transportation fuels, lubricants, specialty waxes or adhesives. The introduction of microwave into this conversion process allows for an energy efficient conversion without the high temperature, combustible environment as traditionally associated with other hydrocarbon conversion processes. The microwave reaction is accomplished in a zero oxygen conditions, at near atmospheric pressure, without the introduction of outside catalysts. The capital expenditure requirements are far less than alternative waste conversion processes of equivalent output. Environmentally, the process is easily permitted under state and Federal statutes and regulations because the operating conditions and emissions are benign. Travis Honeycutt was the inventor for the process, which has received national awards for innovation and sustainability.

Commercial Model: The REI apparatus requires a relatively small footprint to construct the smallest module for efficient placement and commercialization. Being modular the units can be easily expanded for increased capacity. This modular concept allows for units to be placed nearby to the best economic market, either near the raw material source, near favorable labor markets, or near fuel logistical facilities. Placement of units is very attractive for rural areas with lower employment costs, lower land values, proximity to multiple agricultural waste generators and collection points, or access to interstate highways or rail spurs.

Raw Material Input: The REI modular unit receives plastics for processing. All types of plastics are suitable for REI processing from milk cartons to computers; there is no need for sorting as is now the case for most recycling models. There is no need to use only clean plastics; no need to discard dirty plastics or plastics with ink printing. The source of plastics can be from recycling enterprises, industrial plastic product manufacturers, landfills, and various types of agricultural production facilities and agricultural product users. Today, in the United State the disposal of waste plastic is not an environmentally efficient activity and about 90% ends up buried in landfills. Typically, the waste plastic disposal transaction requires a “tipping fee” paid by the waste producing entity to the waste processing entity to land fill or recycle the plastic waste. Consequently, this raw material is received at near-zero or even negative costs, net of transportation. The raw material plastic is dumped from trucks directly into a grinding pit and shredded so to be received by the microwave reactor processing unit.

Microwave Reactor Processing: The microwave technology is the unique and, of course, the essential element in the REI process. To be commercially viable the microwave process must be processed in a continuous flow process. The plastic materials must reside in the microwave reactor long enough for efficient gasification, yet be emitted from the reactor without interruption of the continuous flow. Also, the reactor must be cleared of non-hydrocarbon materials collected during the process. Through years of research, testing and trial runs this process has now been perfected as a continuous flow process.

Finished Product Handling: The plastic hydrocarbons are converted to gaseous hydrocarbons emitted from the reactor and must be captured and refined to the intended finished product. The refining, distilling, storage and transportation of the gaseous product from the reactor are similar to any other commercial refinery. The outflow apparatus of the production unit is the piping, refining, and storage equipment typically found at all refineries. Proper containment of by-product emissions complies with federal and state regulatory requirements. For REI facilities located in remote rural areas, power for the entire unit may be generated from the unit’s by-product gases. The REI facility can fit into even most

the most rural county industrial sites' power parameters. In less remote areas, commercial third-party energy sources may prove to be the preferred economic option.

Optimum Minimum Processing Size & Its Markets: A REI unit may be as small as one microwave reactor unit which can well produce profitable products such as candle wax and other specialty products. That unit can process 10 tons of plastic waste producing 9 tons of produced product daily and can generate from \$0.33 to \$4.00 a pound. Calumet is one company that has expressed interest in purchasing all the candle wax REI can produce.

REI has evaluated based on its relationship with Chevron, for the oil companies the optimum size is a unit of eight microwave reactors able to process 80 tons of waste plastic and produce 400 barrels of synthetic wax daily (or equivalent volumes of other target end-products). Conservative financial projections for an eight-unit module require an initial investment of \$15 million and even at the crude oil spot price of \$30/barrel forecasts an EBITDA of \$15 million annually. For the more expensive specialty lubricant end-products having wholesale pricing 125% to 200% of crude spot pricing the EBITDA at a five-year average spot price is projected to range from \$18.7 million to \$31.1 million once potential commodity buyers are contracted. REI will market the produced products for the licensee and share its profits for the high-value products. According to these forecasts each plant will exceed break-even for crude oil prices exceeding \$10.6 per barrel.

Advanced processing: The basic REI petroleum product that is produced is a near-commodity and generally referred to as a synthetic oil base product. However, even the base synthetic produced by REI has many attributes superior to common transportation fuels. There is no sulfur content because plastic does not contain sulfur and there are no toxic nitrous oxides, benzene, toluene, xylene or cyclic hydrocarbons, due to the low temperature operating conditions. Furthermore, the business objective to produce high value hydrocarbons from low value waste products can be enhanced with incremental investment in the modular processing plant. As stated above, the base synthetic product will sell equivalent to the spot price of crude oil. If other products are produced higher values can be received. For example: Ultra-low sulfur diesel sells equivalent to crude plus 15%. Group III lube base oil sells equivalent to crude plus 100%. Commercial petroleum based wax sells equivalent to crude plus 100%. Each enhancement produces commensurate EBITDA returns for the up-graded REI plant. Generally, the large base refineries (i.e., Exxon) will not interrupt their production runs for these relatively smaller market products, which therefore are perfect for the expanded REI modular unit.

Operations to-date: A development production facility was constructed, in Blackville South Carolina. That plant (one microwave reactor unit) produced and sold high value wax at market value. Consequently, that facility was built in a remote area in South Carolina and did not have the needed supply of plastic to expand and has since been disassembled. Fortunately, we have the samples and the analysis produced from the Blackville facility showing its value for markets such as Chevron and Calumet, who visited the plant and sample its produced products.

Expansion Opportunities: The economic opportunities ahead for REI probably do not require extensive economic analysis. Waste plastic is an immense problem not merely for the United States but globally. Over 90% of all plastics (28 million tons) in the US are transferred to landfills annually, which remain undecomposed for centuries. This is neither a regional issue nor a municipal/rural issue; the rate of waste is uniform throughout the United States. This is also an international issue. Additionally, petroleum availability is an immense problem for the United States economy and the growing international economy. This nation is the world's largest importer of crude oil. Even with the exploration discoveries of other forms of energy, it is unlikely that transportation energy will be derived from sources other than hydrocarbon based. The opportunity for geographically diverse placement is virtually unlimited. Rural placement with sufficient waste resources would offer the global community obvious economic benefits.

The Blackville operation demonstrated its technology and value for the markets. REI is generating opportunities for broad scale deployment of its process through licensing of other facilities nationally and worldwide creating strong financial returns.