THE CLEAN ENERGY SOLUTION FOR DOWNSTREAM PETROLEUM

Why should any downstream petroleum company look at Tesla's Master Plan #3? Because it identifies the downstream hydrocarbon strength in the clean energy transition.

Over the last few years, we have seen the US hydrocarbon industry stressed by:

- US Government intervention
- Geopolitics
- Economically viable clean energy applications
- Government-funded renewable energy projects (EV etc.)
- Governments influence on customers and investors

Now it is time for the Petroleum refineries to get in front of the energy trilemma by utilizing a profitable solution from the Petroleum industry.

The downstream petroleum industry has clean energy solutions today. One is waste-to-fuel energy accumulation, and the other is low carbon energy storage. The waste-to-fuel opportunity is associated with accumulating low-quality waste heat with industrial heat pumps. Tesla's March 1, 2023, Master Plan Part 3 for Sustainable Energy for All the Earth talks about switching to heat pumps in residential, business, and industry. **Multiple sources indicate that the recoverable industrial waste heat industry is valued at more than $50B USD per year.** "Traditional petroleum companies currently own waste heat sources and have the potential to create 5 PWh/year of additional electric supply".1

The Tesla Master Plan Part 3 Tesla document goes on to identify thermal energy storage as a major component to help support the energy transition. **Thermal energy storage** may be achieved with existing refinery assets. This continues to reduce the overall carbon footprint by repurposing existing assets and infrastructure. Furthermore, this approach also takes advantage of the location of many refineries and their proximity to power grids. The waste heat energy can be extracted and stored, and then utilized on the grid at a time of maximum value.

Waste-to-fuel from industrial waste heat is supported by the Albert (Accumulation of Latent BTU's Energy Retention Technology) process backed by technology that has been

proven over many years with performance enhancements today.

Energy extracted with the **Albert** process can then be stored in **CRCES™** (Carbon Reduction Clean Energy Storage), a type of thermal energy storage. The combined application of the Albert process and CRCES™ supports a variety of options to optimize accumulation and distribution of clean energy over a long equipment life. Industrial waste heat has been captured for 40 years and the US has 100's of thermal energy storage tanks, so why not make the change?

Embracing change is not easy. It requires managers who have the incentive, as well as authority to go implement change. However, utilizing Albert technology for waste heat recovery and CRCES™ technology for storage can give the downstream petroleum industry solutions to win the challenge utilizing:

- Existing assets for clean energy
- Trained staff for additional energy production
- Known technology with an upside
- 100% US materials and labor utilization
- Converting liability and cost to profits

Where is the new competition coming from? The same group that published Master Plan Part 3. Notice on the cover of the Tesla Master Plan Part 3 they show a massive Lithium-ion grid storage facility, tied into PV cells. It's not only EV's, but also power generation and "electrification of everything". The reality is, that the traditional downstream petroleum industry **waste heat to energy storage approach has a lower carbon footprint than PV solar with Lithium-ion batteries**. Embracing Albert and CRCES™ technology supports advantages such as:

- Creation of more US jobs per $ of investment versus PV solar and Lithium-ion batteries
- Repurposing current assets
- Waste-to-fuel energy with good ROIs
- Utilizing a current trained workforce
- Building a long-life asset
- Building an asset that can be repurposed and/or 98% recycled with today's technology
- Building an energy grid that is not grossly affected by electromagnetic pulse (EMP)
- Water conservation

The list goes on and on with unlimited life cycles, no future battery replacement cost, smaller land use required for energy storage, and **most important, low cost LDES (Long-Duration Energy Storage)**. What's the bad news? It requires **managers to have the authority and incentives to implement change**. As simple as this sounds, this is the most challenging component in the entire equation.

CONCLUSION

Transitioning to waste-to-fuel clean energy and storage will start with aggregating low-quality waste heat from operations and looking at the power consumption behind and across the meter. Some applications will only use **Albert** to acquire waste heat for conversion to electricity and re-consume it while others will make additional investments to store the energy for arbitrage and/or stabilization of the grid. Today, there is good news that improvements associated with the holistic approach to waste heat accumulation and clean energy storage are ready for prime time. This combination changes the financial results of waste-to-fuel energy projects and gives industries like the d**ownstream petroleum industry an additional revenue source, improved investor message and a real green energy product.**

CONTACT INFORMATION

For more information, visit www.at-v.com and select 'Carbon Reduction' or email us at green@at-v.com.

Footnote 1: Tesla Master Plan Part 3 April 5, 2023