



## ITEZZE – Service Station Information Sheet

Please Note: Figures are estimates only and **do not** include car and bus Hwy use

**ITEZZE**

**Synopsis** - In 2012 an IMF study<sup>i</sup> forecast oil prices rising 1400% to around US\$1300/barrel. Diesel/petrol fuel at \$10/liter is not economically viable in Australia. ITEZZE is the one system able to replace oil fuels in road transport; mines and agriculture. ITEZZE expect Hwy trucks to be operational in mid-2023 and EVs for general and family use by the end of 2023. An ITEZZE service station network with sites 150-230 km apart is required.

**General Information** – In the beginning of the 2000's Volvo got into Hwy Truck markets in Oz with semi/Prime movers with 2000 litre fuel tanks. It enabled operators to purchase fuel in bulk in Sydney/Melbourne and drive from Melbourne to Brisbane in a single fuel load. This meant they bypassed the national Hwy service station network without needing fuel with stops at highway truck road sidings. With oil peaking in 2020 and oil output falling from 2021; the transport industry needs to alter their fuelling regime. The industry has determined that built-in battery trucks don't work as the Australian Chief Engineer of one truck company described one new EV release truck as, "Useless, it can drive from Melbourne to Bendigo and has to recharge for 2½ hours in order to drive back." Volvo has released a battery-operated Semi-trailer in New York. It can drive 250 km on 370 kWh of battery. A 370 kWh battery weighs from 3.7 to 5.9 tons depending on the type of material used to make it. Putting 17-26 tons of battery onto a truck to drive from Sydney to Melbourne will give it **no** capacity for goods.

Swap batteries is the only mechanism for running long distance trucks. It takes US\$2.1 million worth of swap batteries to drive a semi-trailer from Brisbane to Sydney (each way).<sup>ii</sup> A 370 kWh draw will require a 470-500 kWh battery because the battery only outputs 78-80% of power without dramatically reducing life cycle times. In the 6 years before 2022, one major car maker has had to recall their EVs 5 times to replace their batteries. It is presumed it loses around \$20,000-30,000 on every EV sold; but they only sell 1x EV for 50 other vehicles, so they can stay in business. The ITEZZE paradigm of selling EVs 'bare' without batteries takes this Risk off them.

ITEZZE makes this possible by managing the electricity flows into the battery; so, it ensures ITEZZE get paid for the power; batteries are not rundown over 80% and they can use high kWh life cycle batteries. So, even if the batteries are more expensive; because the kWh cycle life can be managed and fully expensed, they will be less expensive. This means that ITEZZE can sell the kWh life cycle for 14½ -17.1 cents/kWh (US\$). If 11 cents/kWh (all amounts are in US\$) is factored in for electricity delivery expense (production/generation and grid Fees); the power can be sold to truckers and car customers for 51.7 cents/kWh with a 20-21% margin for the servo. 51.7 cents/kWh may sound expensive but a small family size car in Hyundai (**i30** with **ionic** as the EV) uses 1.7 kWh/litre of petrol replaced with electricity. Hence, they will be using 1.7 kWh/litre which at 51.7 cents/kWh equals 69.86 cents/litre (or around AUS\$1/litre). They also pay a 'Swap Fee' of \$4-10/battery (\$30 for trucks).

**The Value Proposition** - Hwy trucks weren't stopping at servos; but under the ITEZZE system **they have to stop** at 250 km intervals. Most truckers **don't want to stop** at 2½ hours (under Govt drive rules they have to take a 15-minute break at 2½ hours or a **30-minute break at 5¼ hours**) hence they want to stop for the longer rest. ITEZZE has overcome the problem by instituting a '**High Speed Swap**' for truckers at 2½ hours. So, they order their battery swap enroute; drive into the servo; pick up their coffee/donut and swap their battery in 1 minute and 30 seconds. The girl hands the donut through the window. Hence, they don't need to get out of the truck and the swap doesn't count as a '**Rest period**'. They drive on to the 500 km swap site and take a rest there.

The ITEZZE servo operator gets \$330-\$400 for the swap (\$570 for large trucks) plus food; and develops a profit margin in the order of \$70 (30% of the 'Swap Fee' plus 20% of the kWh fees + food). Given that trucks have to stop, this provides guaranteed cashflows. When truckers get into 530 km highway sites, they take their time; chat to their friends. They have to park for around 30 minutes (the swap is not part of their rest period). They probably spend more money than just the small fees at the high-speed swap, but the interaction adds value. It is expected that the av. 500-530 km site will have 75-90 trucks parked on it at any one time during the 17-hour high turnover period of each day. Govt is invited to subsidize Retro-Fit of Hwy buses/freight trucks from diesel to ITEZZE operation (cost US\$100k per bus/truck with proposed Govt rebates of \$50,000). An ITEZZE B-Double truck on 6-day operation (with diesel at \$3/litre) saves around \$6,000/week and on double shifts (i.e. it swaps drivers and then drives back immediately thus doing 2,000 km/day), it saves around \$12,300/week (on 6 days). ITEZZE expect, if 7,000 trucks are running Sydney-Melbourne route (or Sydney/Brisbane) and doing 9,000 trips per day (5,000 doing single trips with 2,000 doing double trips) there is good room for Servo Operator margin.

<sup>i</sup> *Oil and the World Economy: Some Possible Futures* by Michael Kumhof and Dirk Mui; IMF Working Paper October 2012 **WP/12/256** Authorized for distribution by Douglas Laxton

<sup>ii</sup> See: ITEZZE.com/trucks;& go to Video