COMPARISON COSTS OF (LOW CO_2) PEAK-NET-LOAD-REDUCTION

When faced with insufficient generation to meet demand, the electricity grid only has three options: Increase supply, decrease demand through management, or curtailment of demand (power cuts).

To illustrate the value to the grid of modulating aluminium smelters we give a comparison cost against other peak net load reduction options for a 200MW reduction.

SOLAR AND/OR WIND

Capital Cost: A$280m per 200MW.

Operating cost: N/A

Advantages: Cheapest Levelised Cost of Energy (LCOE), clean renewable

Disadvantages: Not dispatchable (dependable), 'idle' investment

GRID LEVEL BATTERY

Capital Cost: A$640m per 200MW (four hours = 800MWH).

Operating cost: Energy Arbitrage + 20% efficiency loss

Advantages: Extremely fast. Short recharging cycle. Smaller batteries can be located close to demand

Disadvantages: Limited duration (up to 4 hours but usually 1.5 hours at full discharge)

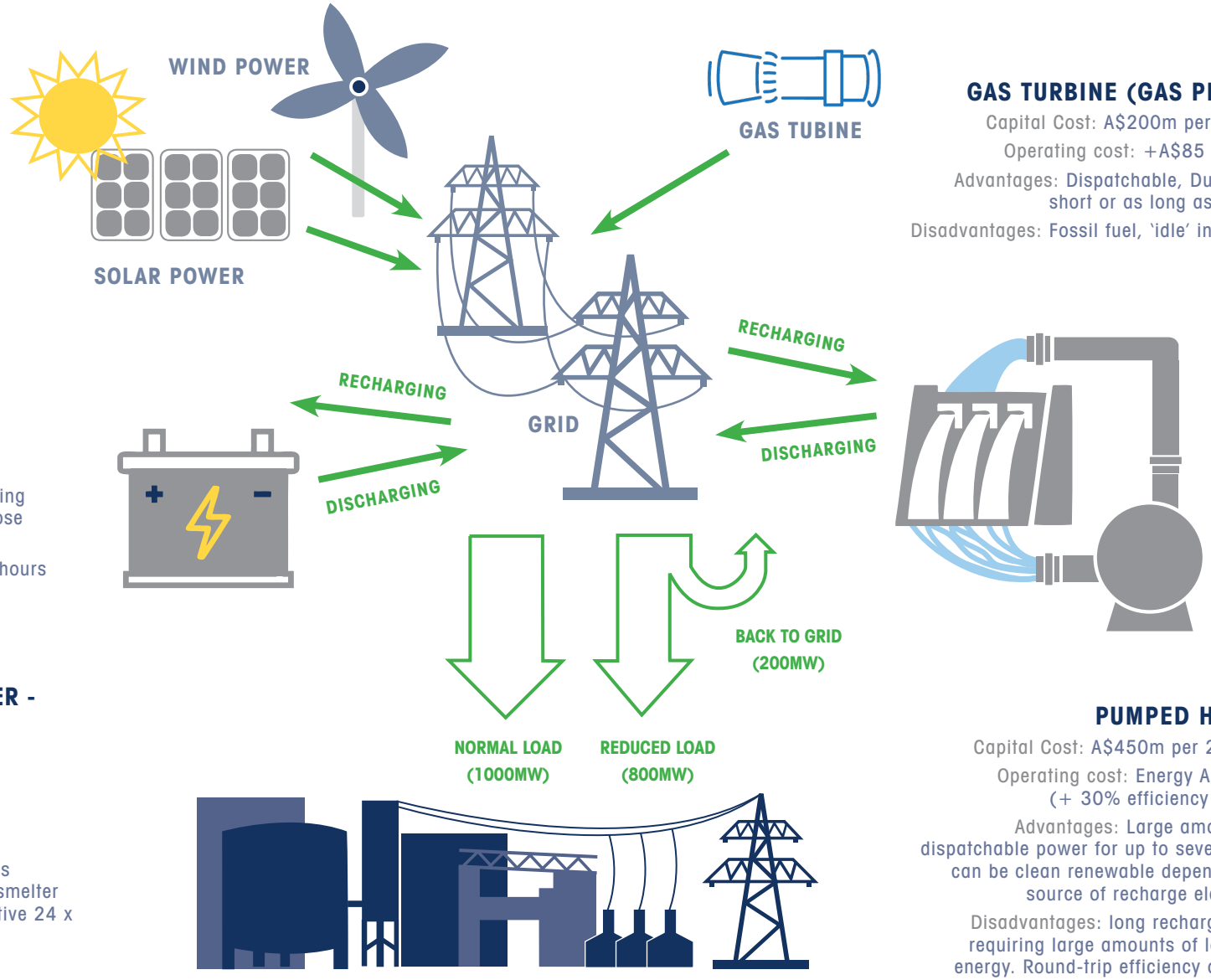
MODULATING ALUMINIUM SMELTER - DEMAND SIDE MANAGEMENT (DSM/DSR)

Capital Cost: A$70m per 200MW

Operating cost: Energy Arbitrage (to offset reduced Aluminium production)

Advantages:Duration as short or as long as required, 100% round-trip efficient, fast, smelter does not need recharging. Smelter productive 24 x 7 even under reduced Load.

Disadvantages: None.



GAS TURBINE (GAS PEAKER)

Capital Cost: A$200m per 200MW.

Operating cost: +A$85 per MWH

Advantages: Dispatchable, Duration as short or as long as required

Disadvantages: Fossil fuel, 'idle' investment

PUMPED HYDRO

Capital Cost: A$450m per 200MW.

Operating cost: Energy Arbitrage (+ 30% efficiency losses)

Advantages: Large amounts of dispatchable power for up to seven days, can be clean renewable depending on source of recharge electricity

Disadvantages: long recharge cycle requiring large amounts of low cost energy. Round-trip efficiency of 70%.