Coal-Fired Electricity for Vietnam: Expensive, Dirty & Unpopular

How Vietnam Can Use Existing Technologies to Produce Lower Cost and Cleaner Electricity and Why It Doesn't

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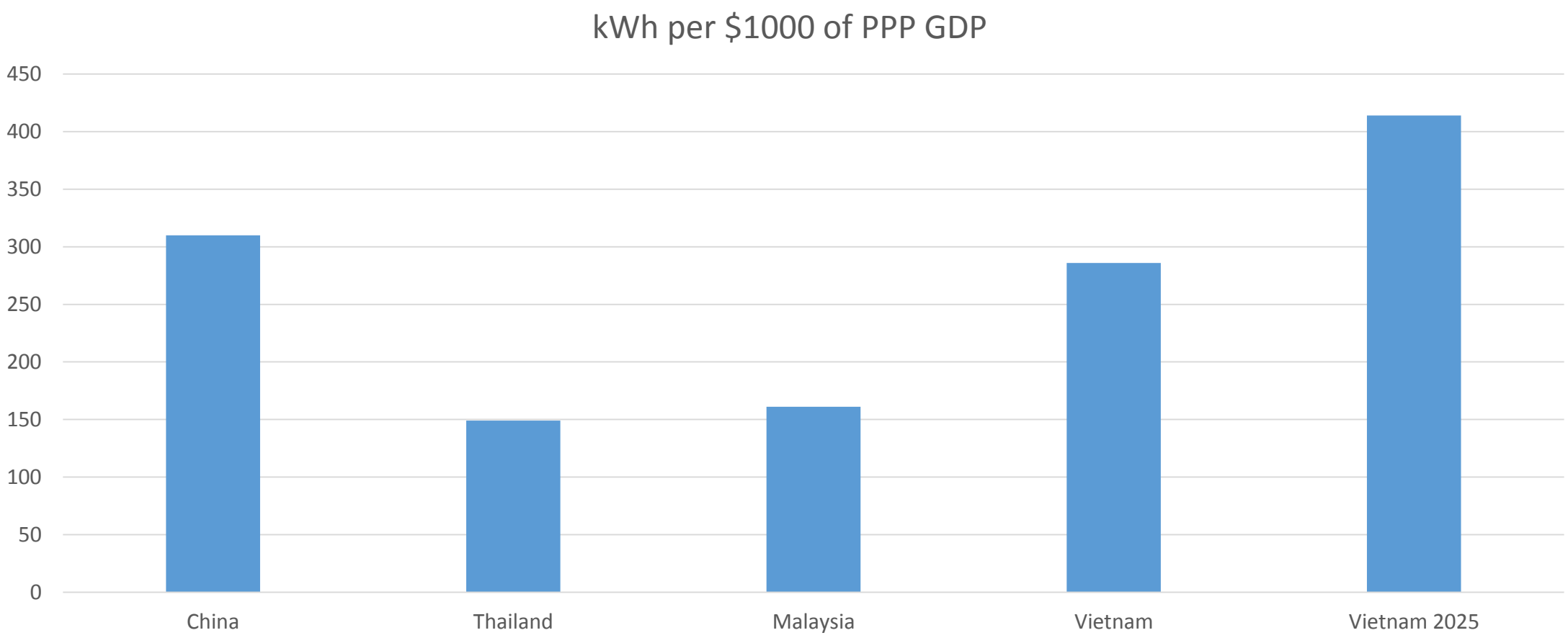
Main Points

- Coal fired electricity is dirty as currently burned and unpopular
- Coal as now used is a bit more financially costly than renewables
- Coal can be burned more cleanly but is then much more expensive
- Coal's external costs (excess deaths, pollution, carbon) are high
- Electricity demand per unit of GDP is high and should be lower
- Renewable costs are falling 9-12% a year and will be much cheaper
- Coal takes 4-6 years to build; solar and wind only one year
- Renewable use should be much higher, but requires transmission and storage investments – and institutional barriers prevent rational choices

Vietnam's 2015 Electricity Use is High per Unit of GDP

(Vietnam in 2025 assumes 10% a year electricity growth and 6% a year GDP growth)



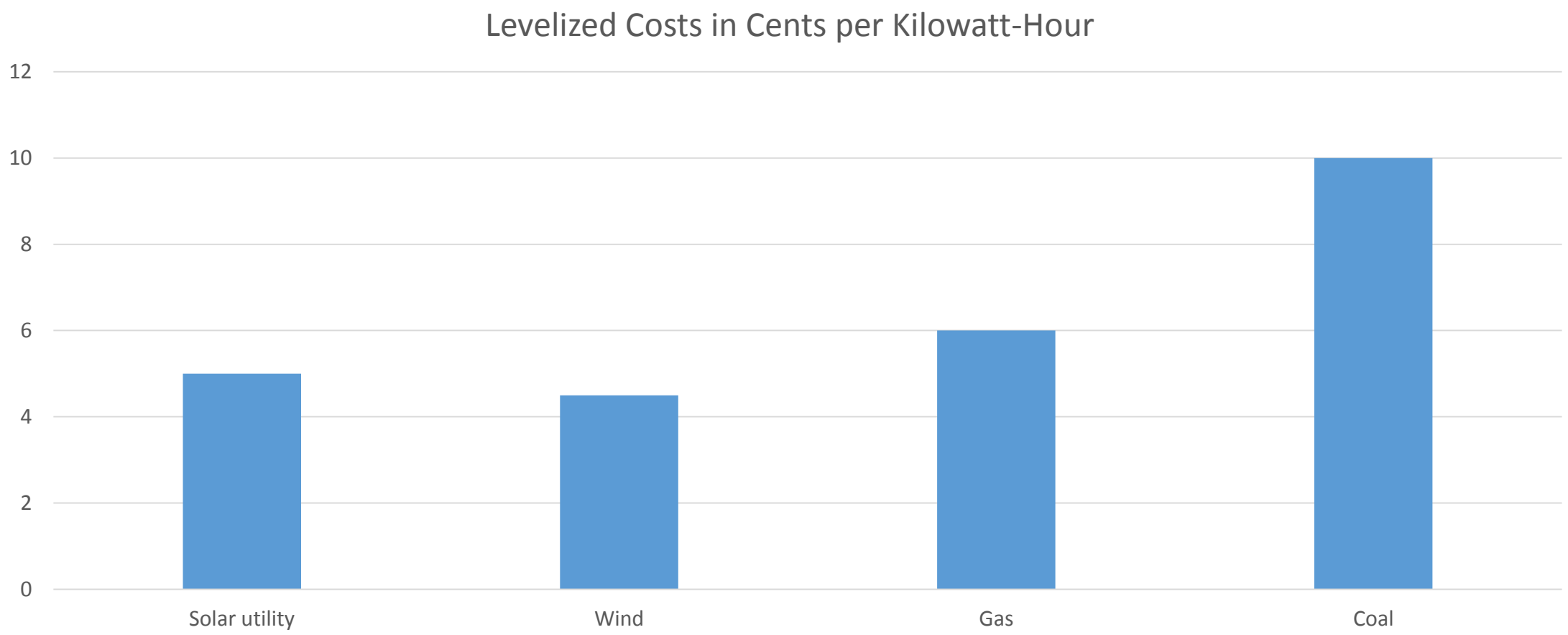
Why is Vietnam's Electricity Use so High?

- Electricity is cheap – prices are lower than the cost of production from new plants and for delivering it.
- That is, prices are closer to average cost, not marginal cost – the low costs of old hydro power should be used to improve reliability instead
- There has been little official attention paid to developing efficiency in buildings, appliances, machinery or other industrial processes.
- Many thermal generating plants are not very efficient
- Major gains if prices and investments/regulations reduce demand
- China's electricity growth is now lower than its GDP growth

Renewable Energy Costs Are Falling Fast

- US Utility Solar Costs Fell from $4500 per kilowatt in 2009 to $1100 per kilowatt in 2017. This includes panels, inverters, land, and connections to the grid. Hardware alone is less than $1000 now in the US and lower than $800/kw in Vietnam – costs will drop more
- Solar and wind work well with hydroelectricity and gas which can cycle up and down quickly to match varying renewable output
- Coal does not work well as power output is hard to adjust quickly
- Solar bids in India, unsubsidized, coming in at 4 cents per kWh; levelized costs in US are 4-5 cents per kWh; Vietnam should be equal or less
- Solar & wind units can be installed in one year, responding to actual demand.

Lazard Estimates of US Electricity Costs, 2017



Coal Has Big Non-Financial Costs

- In China, 10,000 tons of coal are associated with one premature death each year. Vietnam plans to burn 120 million tons of coal in 2025 with current energy plan
- That would mean, if a similar ratio, 12,000 excess deaths in 2025.
- Popular opposition to coal plants is growing – harder to license
- Land prices drop where pollution rises – hurts local governments
- If carbon taxes are adopted, cost of coal power could rise sharply
- Coal will be imported – price uncertainty and foreign exchange drain.
- Only Asian sources will finance coal plants – rely on narrow sources

Coal Plants Take 4-6 Years to Build

- Electricity needed in 2022-23 requires a coal plant be started now
- Solar or wind units can be installed in less than one year
- Prices for solar and wind are falling 9%-12% a year
- A 2021 renewable price will be much less than one today
- A fair analysis compares future renewable with current coal costs for the same time of delivery
- Storage costs (batteries, pumped hydro, other) are also falling fast – overcoming the main drawback of renewables
- Smart grids with negotiated short-term power cuts also help prevent brownouts and blackouts (E.g., fifteen minutes without A/C)

Sequencing to a Cleaner Future is Realistic

- Build gas plants to use Blue Whale Gas now, import propane in interim if no further imports; use LNG if expensive terminal can be used beyond Blue Whale production. (Propane is more expensive than LNG but has a low cost terminal.)
- Explore for more gas to use for new power plants
- Start now on smart grids - lower peak demand; improve T&D capacity
- Allow solar/wind and hydropower to package supply for daytime peak
- Secure low cost loans for renewable energy
- Promote efficiency and gradually raise electricity prices to costs

Why is Moving to Renewables to Hard?

- Fall in solar cost is recent – some mangers refer to old higher costs
- Feed-in tariff of 9.35 cents per kWh is not popular with EVN – more losses since power prices now average 7 cents – switch to bids
- Localities often give best sites to local investors with little money who hope to contribute land at a high implicit price to a joint venture
- EVN is familiar with and sometimes benefits from new coal plants
- Renewables work best with system changes – smart grid and storage which are not now familiar or part of current system
- But, high existing proportion of hydro and gas sources would work well with solar/wind

Conclusions

- Vietnam could use less energy per unit of GDP while growing fast
- Vietnam could grow cleaner by using cheap renewables – more popular
- Coal is more expensive now and more costly than it seems – external costs will and carbon taxes could make it even less competitive
- Renewable costs will be falling and are already competitive
- Other technologies (storage, smart grids) support renewable energy
- Electricity pricing and grid enhancement need attention
- Both China and India are heading in this direction rapidly
- Vietnam needs to improve procedures to use more renewables

Appendix: Comments on Myanmar Power

- Former ruler General Than Shwe signed poorly negotiated hydro contracts with Chinese companies, getting only 10% of benefits for Myanmar – Nepal gets 20% or more from India for similar projects
- Dams are built without ethnic approval or benefits – not sufficient compensation for many who are displaced – prolongs ethnic wars
- Dams are sited in historic and culturally important areas
- Dams suffer from poor environmental analysis – big and poorly understood impacts on sediment, river banks, fish, etc.
- Dams are very unpopular, even among Burmans not directly effected