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PREF. SUBJECT : 2
QUESTION N° : 2.9

2.9 - Many countries have been installing wind farms of varying sizes over the last decade or more. What is the experience of other wind farm owners/operators in terms of capacity factor, availability, and operation costs of wind farms, and are similar hybrid wind-hydrogen-battery storage schemes as described in this paper being considered or installed?

- Almost of wind farms in the private sector have a capacity factor between 30 – 40 % annually depending on produced energy, rated power, and survey time. Survey time is the sum-up of turbine ok time, downtime, maintenance time, repair time, grid outage time, weather outage time, external stop time, external stop power time, and customer stop time. All values came from the data recorded by SCADA. Availability factors depend on downtime, repair time, maintenance time, and survey time, which are over 95 % guaranteed by the O&M partnership, and its operating costs are based on the balance of plant by the local company.
- The government sector wind farms have the capacity factor same as above, the operating costs are based on the balance of plant by the own employees, but the availability factor is 80% approximately as below reasons:
 - (1) force outage with issue spare part replacement requirements (almost all spare parts purchased from OEM supplier),
 - (2) force outage with issue line to ground fault (this issue takes time to investigate and repair), and
 - (3) plan outage with yearly inspection (semiannual and annual inspection).
- The hybrid wind-hydrogen-battery storage schemes wind farm is only installed in the research project of the EGAT (Electricity Generating Authority of Thailand) as the government sector. There is neither consideration nor installation of the hybrid wind-hydrogen-battery storage schemes windfarm in Thailand's private sectors.