

The paper evaluates the potential of producing hydrogen with nuclear power reactors, as the residual load after generating nuclear power in a load-following mode (the hatched area at Fig.1). With increased penetration of renewables in the future, nuclear power will be asked to follow the load in a mode intensive way. Hence using nuclear power in excess to produce hydrogen will insure a steady-state operation of nuclear reactors, which could be an interesting option for both technology maintenance and operator business model.

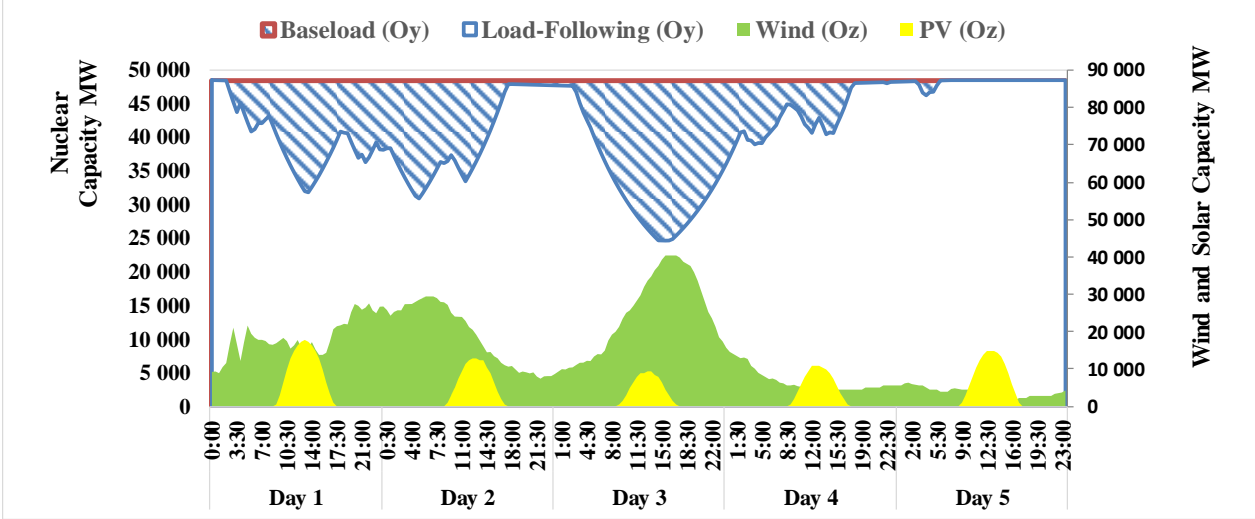


Fig. 1. Hydrogen production in 2035 over five days in January (the hatched area) obtained from residual nuclear power operating load-following

Figure Reading: the nuclear power vary over the day, and so the hydrogen production (the hatched area), as a function of the hourly wind and solar inflows. When intermittent flows are absent, the nuclear reactors operate full load (the red line) to supply the electricity demand, hence hydrogen production is zero (Day 5). In sum, the hydrogen follows the intermittency of the residual load, e.g. demand net of variable renewables.