COMPARISON OF "SHAFT-SHAFT" SET-UP EFFICIENCY WITH OTHER SET-UPS OF THE CCS TURBINE

There could be a need to compare the coupling shaft-shaft between a motor (e.g. electric) and a power supplier (e.g. alternator), and the coupling between an electric motor (e.g. fan) and a power supplier (e.g. alternator) on a turbine CCS.

How to proceed:

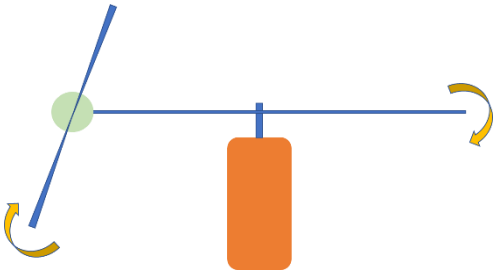
Coupling electric motor and alternator in shaft-shaft mode

Motor *Alternator*

In this case the coupling of the gears or the gear train is optimal and we give it a coefficient of efficiency 1 (K = 1). Don't worry about the friction loss: it doesn't matte ras this is a demonstrative context.
Suppose the motor electrical energy is almost the same as the mechanical one transmitted to the alternator shaft and the latter is transformed in electrical energy supplied by the alternator

Coupling between an electric motor (electric fan) and alternator in CCS turbine mode

Fan *Alternator*



In this case the coupling is not optimal as only a part of the fan electrical energy becomes thrust mechanical energy……that is the one that gets multiplied on the alternator on the CCS turbine set-up.
So the coefficient of efficiency k is < 1…….
I would say that it's notably inferior to 1 (K= 1/E) with this set-up

If you want to experiment and compare the two set-ups, in order to actually do it, you have to keep in mind the coefficient of efficiency of each system.
To compare the w produced by the alternator on the two set-ups, compensating the efficiency levels so that the coefficients K are equivalent is necessary. The fan power needs to be increased compared to the electric motor power by multiplying it by E…..
For example, if on the shaft-shaft set-up, there's an electric motor that thrusts 100 w then I must have a fan with the same power as the power of the electric motor multiplied by E, in order to have a correct comparison.

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