
CSP TECHNOLOGY IN THE MARKET

Value of CSP in the Power System



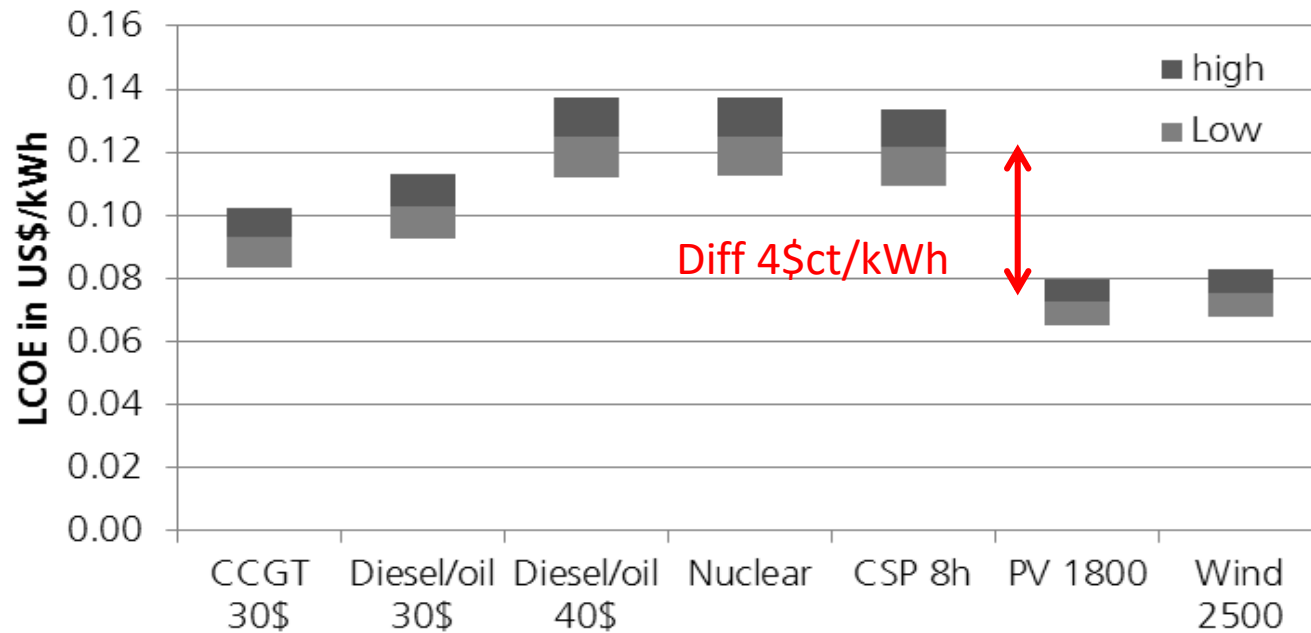
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Cost vs Value?!

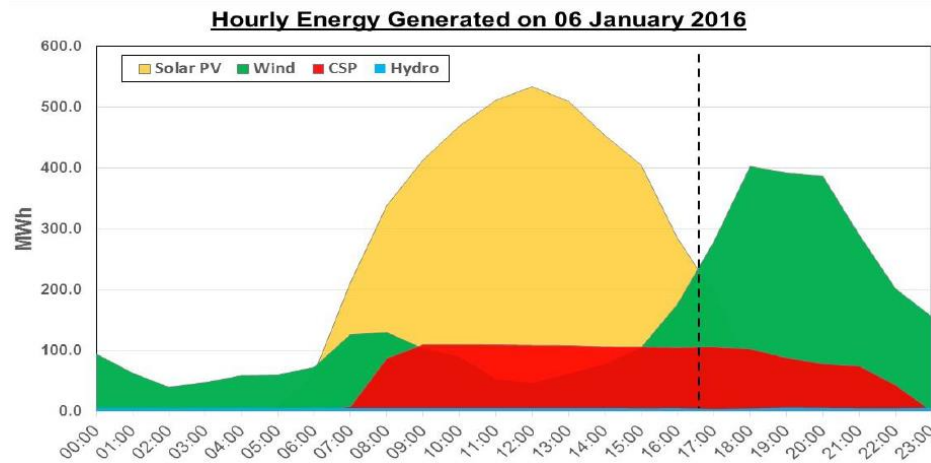
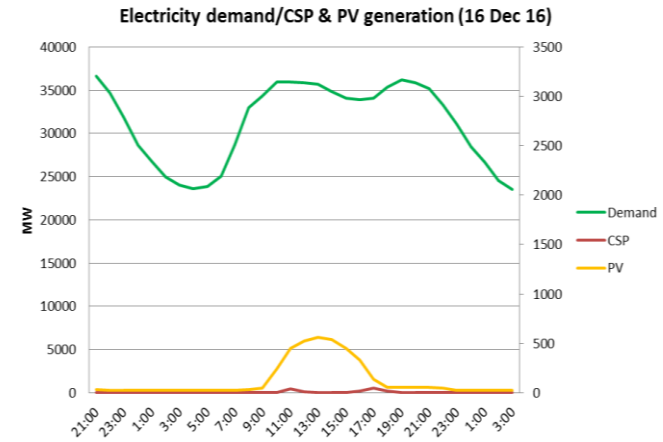
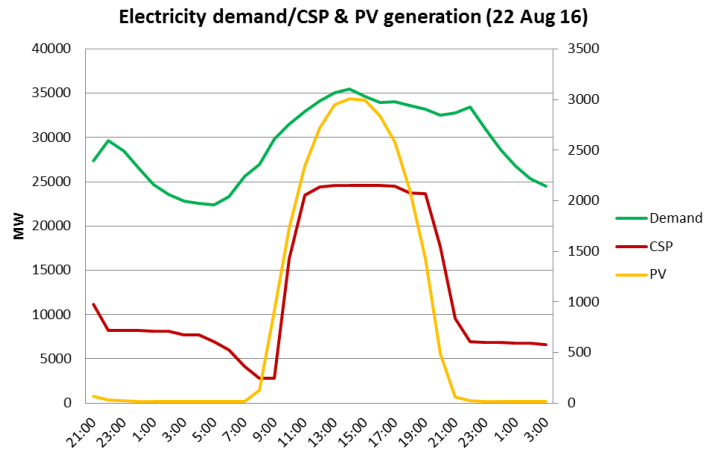
PV and wind with low LCOE, but CSP also not higher as other technologies



		CCGT 30\$	Diesel/oil 30\$	Diesel/oil 40\$	Nuclear	CSP 8h	PV 1800	Wind 2500
CAPEX	\$/kW	1000	150	150	6000	4500	1000	1500
Interest	%	10%	10%	10%	10%	10%	10%	10%
Var. OPEX	\$/kWh	0.02	0.01	0.01	0.01	0.01	0	0.015
Fixed OPEX	\$/kW	22	30	30	200	30	30	5
Output	kWh/a	7000	7000	7000	7500	4200	1800	2500
Fuel prices	\$/kWh	0.03	0.03	0.04	0.005	0	0	0
eff	%	55%	35%	35%	100%	100%	100%	100%
Degradation	%	0.2%	0.1%	0.1%	0.0%	0.1%	0.4%	0.1%

Operation has to be adapted to each system and the current situation

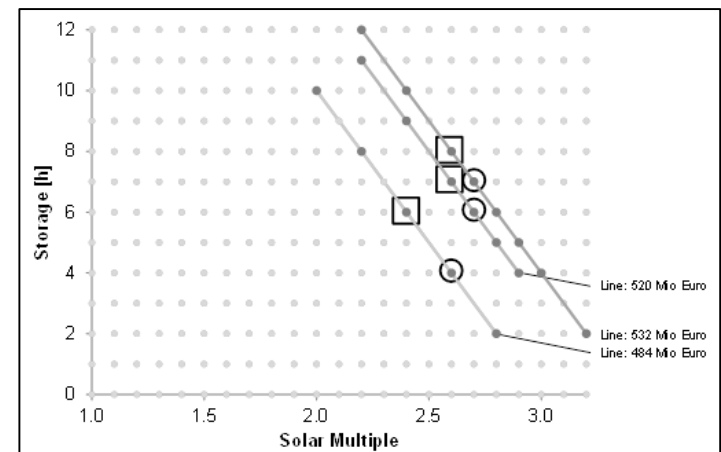
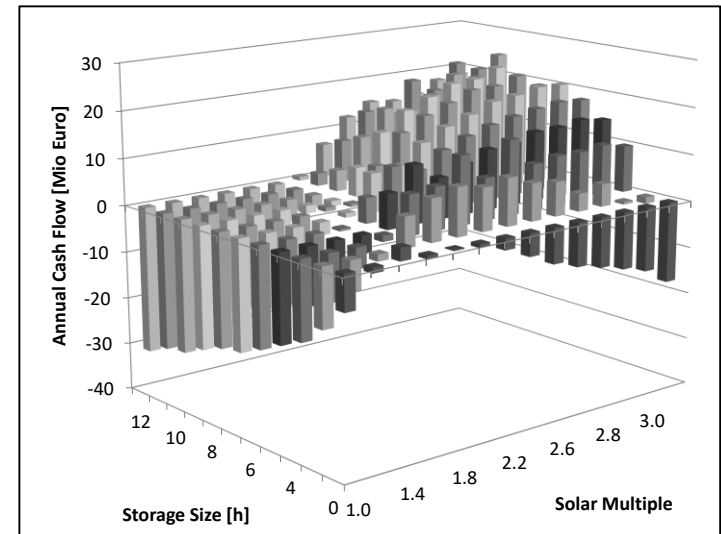
Generation in Spain peninsula and South Africa



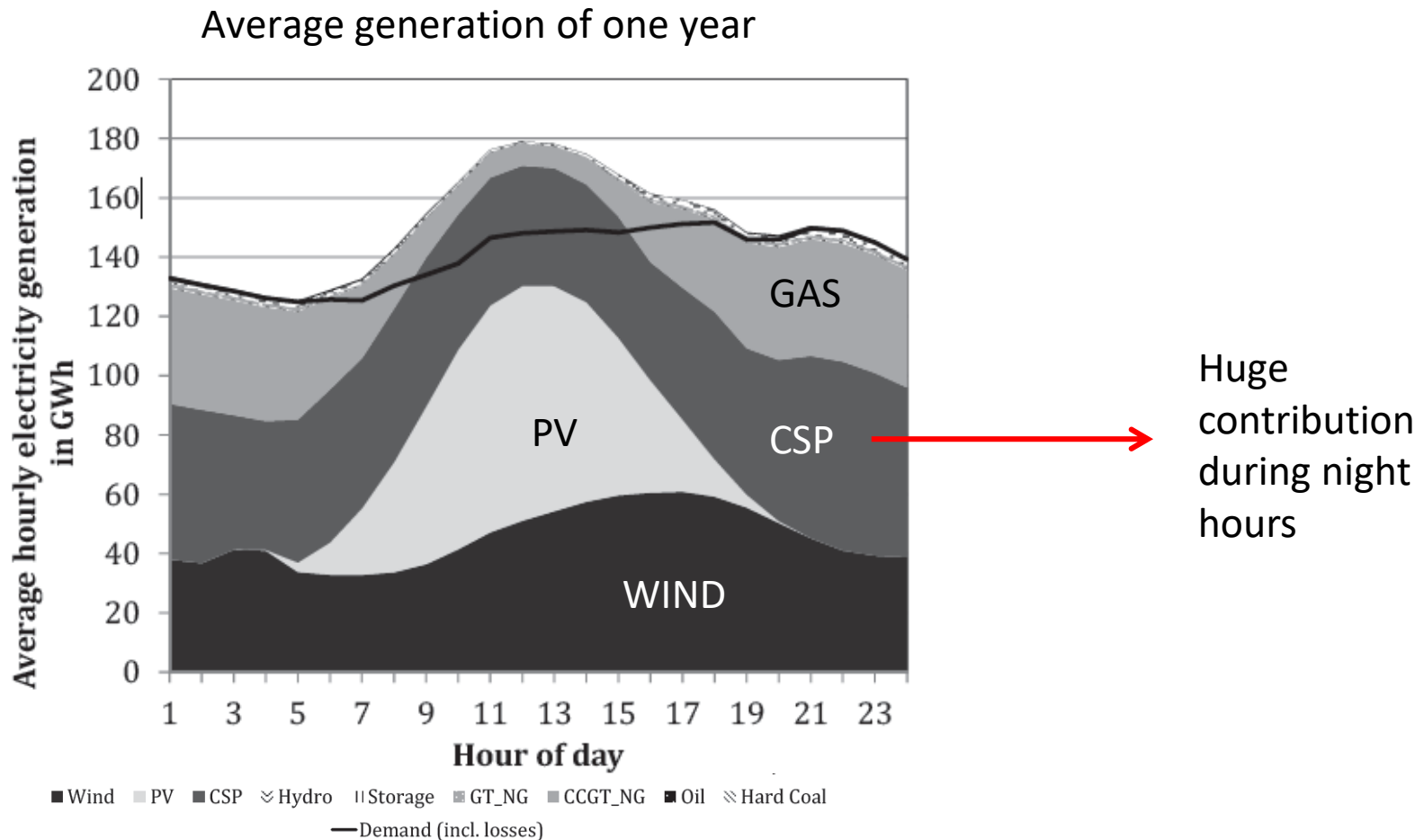
RSA in 1.H 2016:
70% of high prices
hours

A key decision: Plant layout and storage size

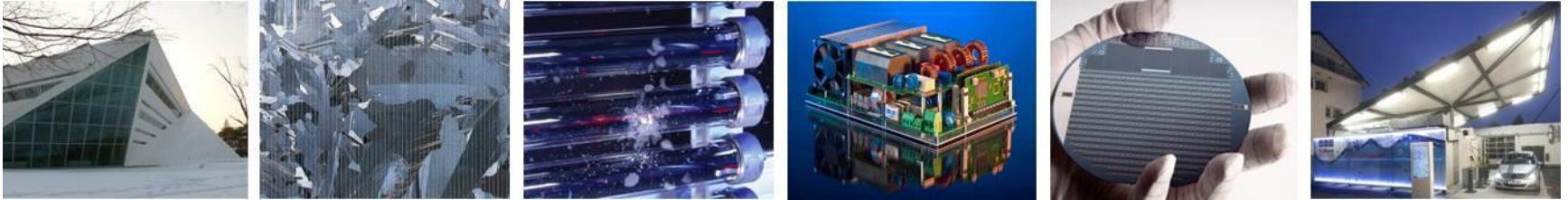
- Flexible operation and evening peaks: energy storage of 3 to 4 hours
- Larger Storage (>10h) -> continuous generation
- Strong dependency on
 - Demand structure
 - Other power plants (and expansion plan for flexible pp)
 - Role of PV and wind (resource of wind)
- Size of storage strongly impacts absolute volume of investment (of course also the absolute output of energy)



Future role of CSP in a system with high shares of RES



Thank you for your kind attention!



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