# Base load electricity from PV-CSP Hybrid Plants

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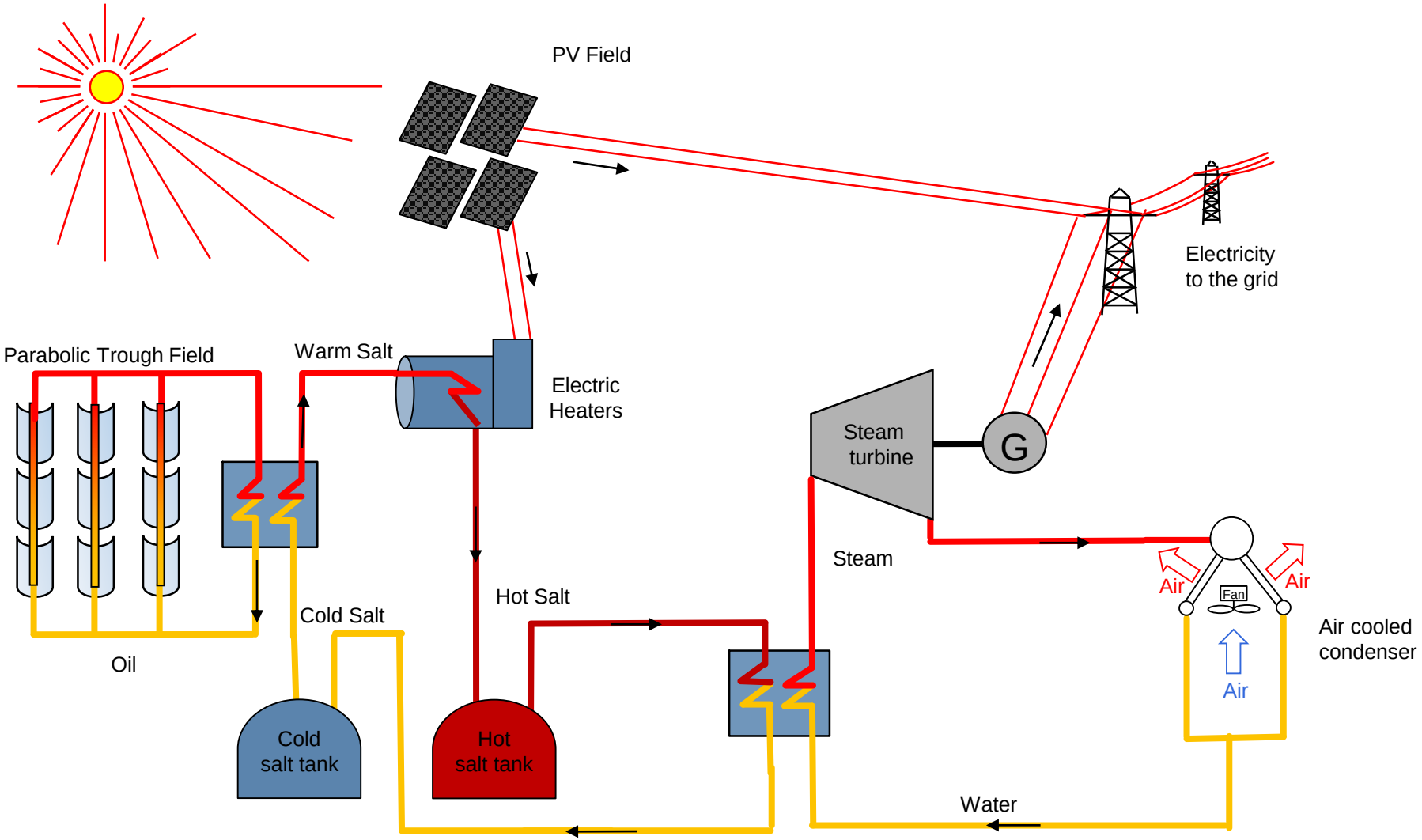
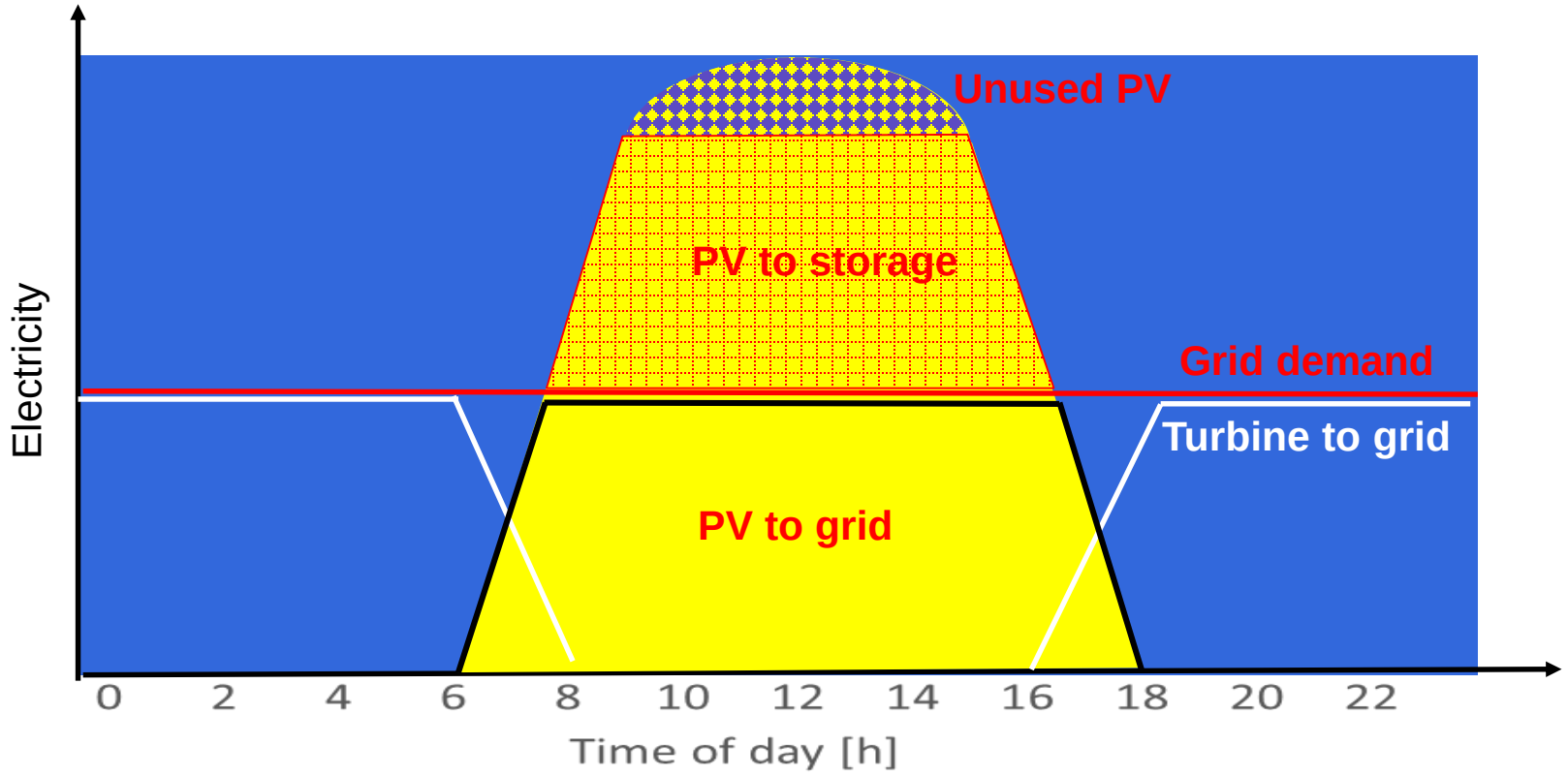
# Concept of a CSP/PV hybrid system



# Energy generation by a CSP/PV hybrid plant

## Potential daily scenario



# Why hybridization?

## The Pros and Cons of CSP/PV hybrid power plant

### Advantages

- Dispatchable
- Large storage capacity
- Large base load power capacities (> 200MW)
- Low electricity cost for base load

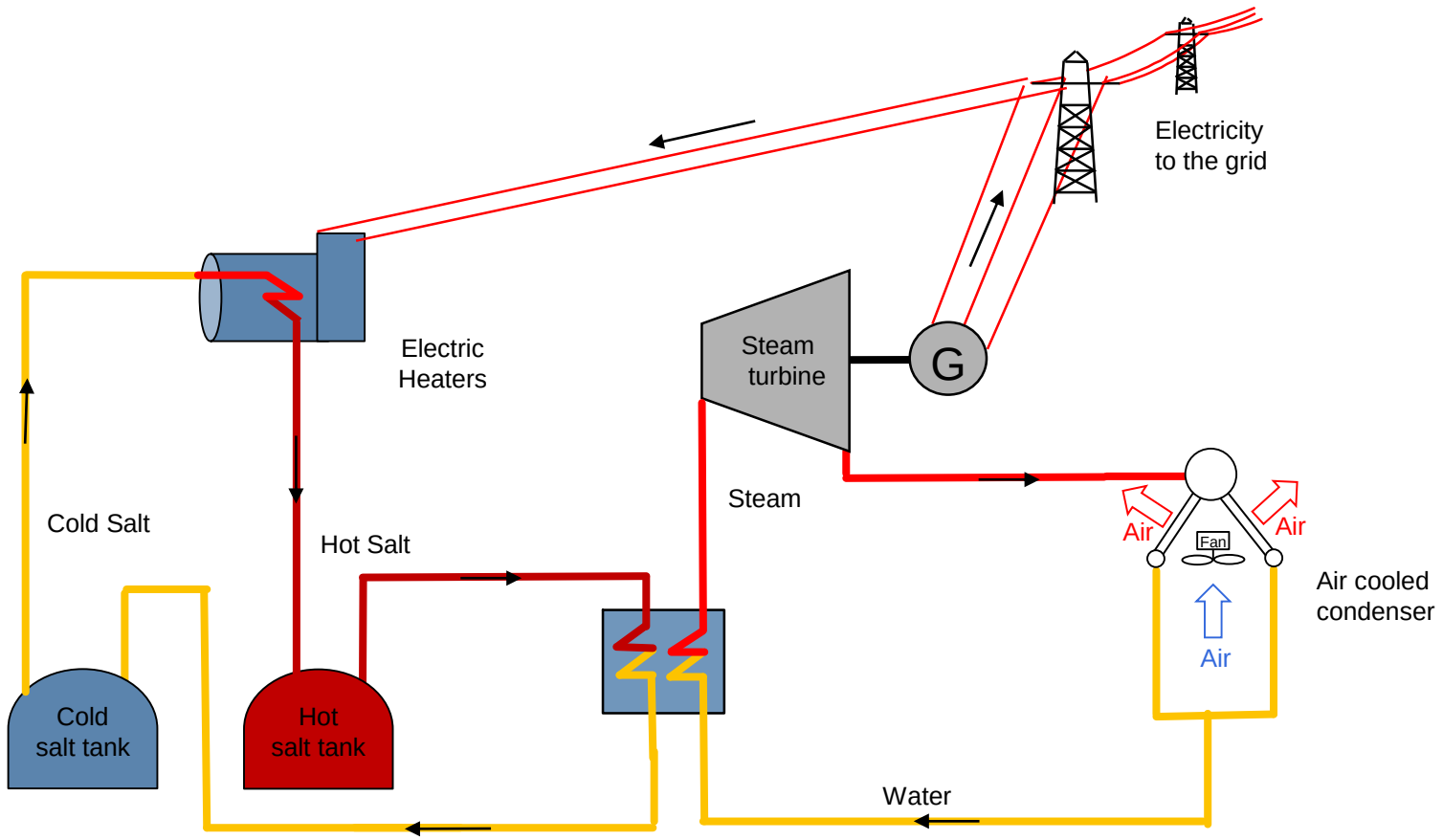
### Disadvantages

- Restricted to large projects: Economies of scale require large initial investment
- Higher LCOE than pure PV

### Synthesis, for different grid situations

- Few volatile sources→ pure PV most carbon efficient
- **Much volatile energy → CSP-PV hybrid required**
- **Fully saturated with volatile energy → CSP as load shifter best**

# Concept for a Thermal Battery System




Possible market entries
- Green field
- Consumer side (Co-gen possible)
- Added to large PV plants (w/ or w/o CSP)
- Second life for coal-fired power plants

Coal replacement currently investigated in e.g.
- Denmark (wind)
- Germany (wind+PV)
- Spain (PV)

- US Southwest?

# THANK YOU FOR YOUR ATTENTION

Questions and suggestions to mark.schmitz@flagsol.de