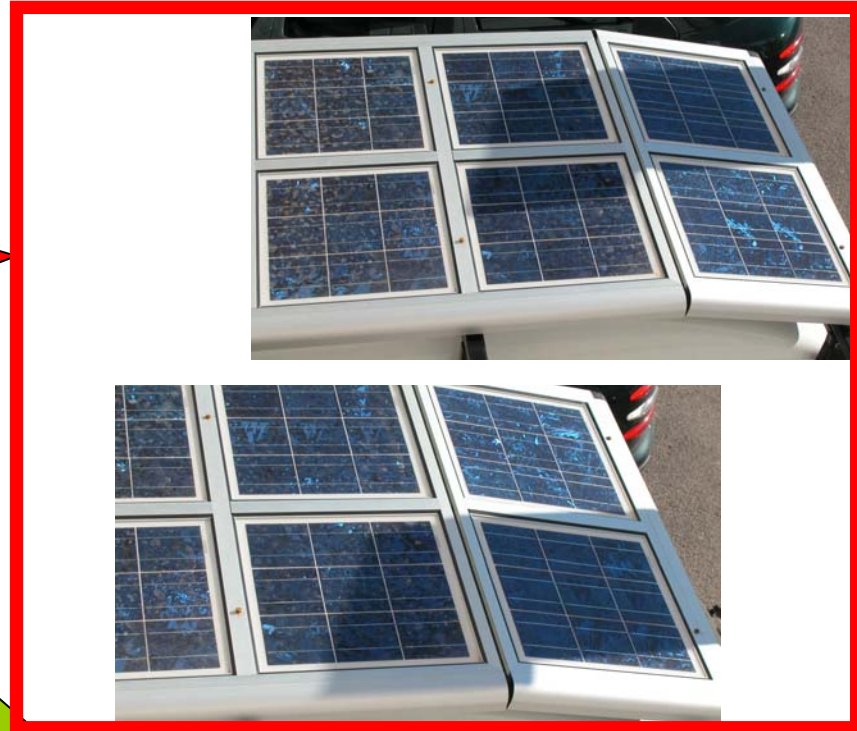


Sources of mismatching

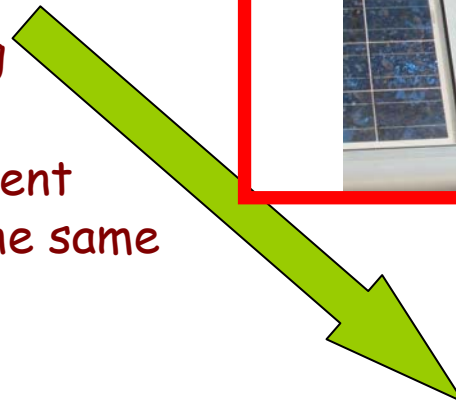
➤ Different solar irradiation levels due to:

- ✓ Clouds
- ✓ Shadows
- ✓ Different orientation of parts of the PV field
- ✓ Dirtiness



➤ Tolerances (due to manufacturing and/or ageing)

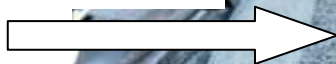
➤ Different types of panels (different models, photo-glass, coloured) in the same string



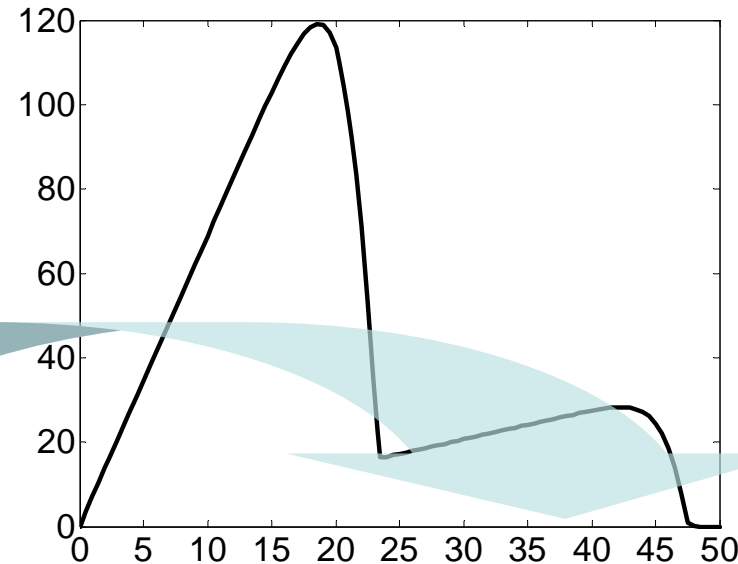
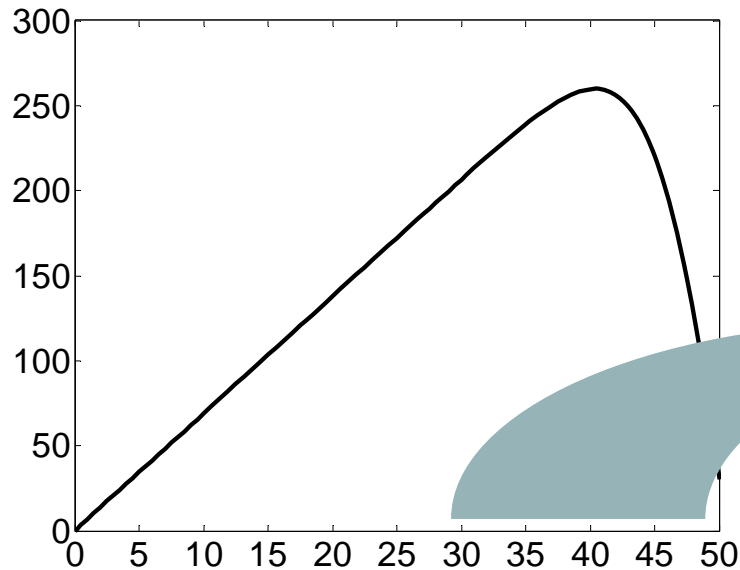
Le difficoltà di progetto: mismatching



salsedine



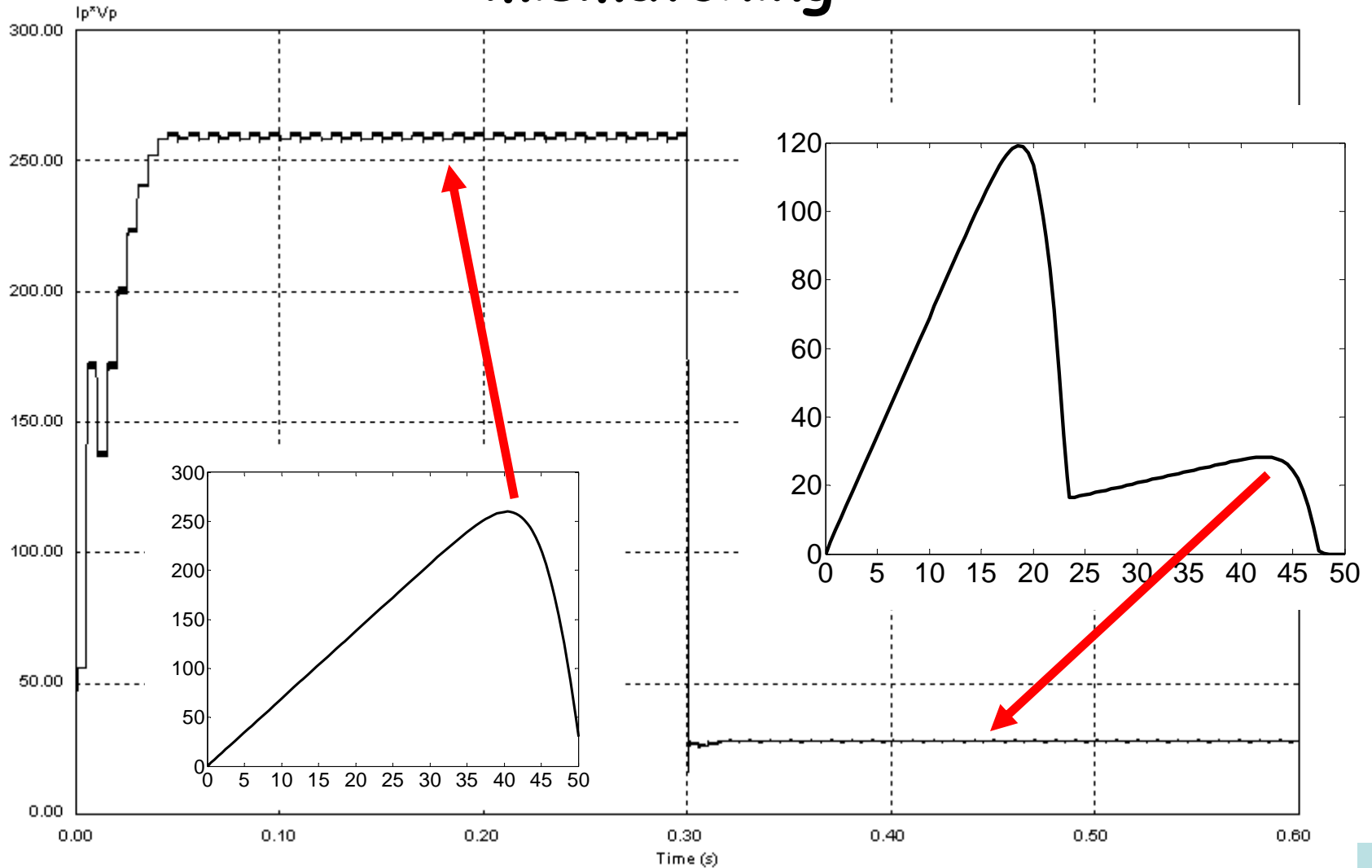
E' conveniente in queste condizioni usare un convertitore mppt di stringa?



Se uso la tecnica P&O potrei rimanere "intrappolato" nel massimo locale!!



MPPT control usually fails under mismatching



Ma è praticamente possibile usare stringhe di poche celle?



Ogni cella ha $V_{mpp} \cong 0.5V/0.7V$, $I_{mpp} \cong 7/8A$

Ad esempio: stringa da 10 celle in serie $\rightarrow 5V$

La batteria: 210Ah @ 12V

E' necessario usare un convertitore innalzatore (boost)!

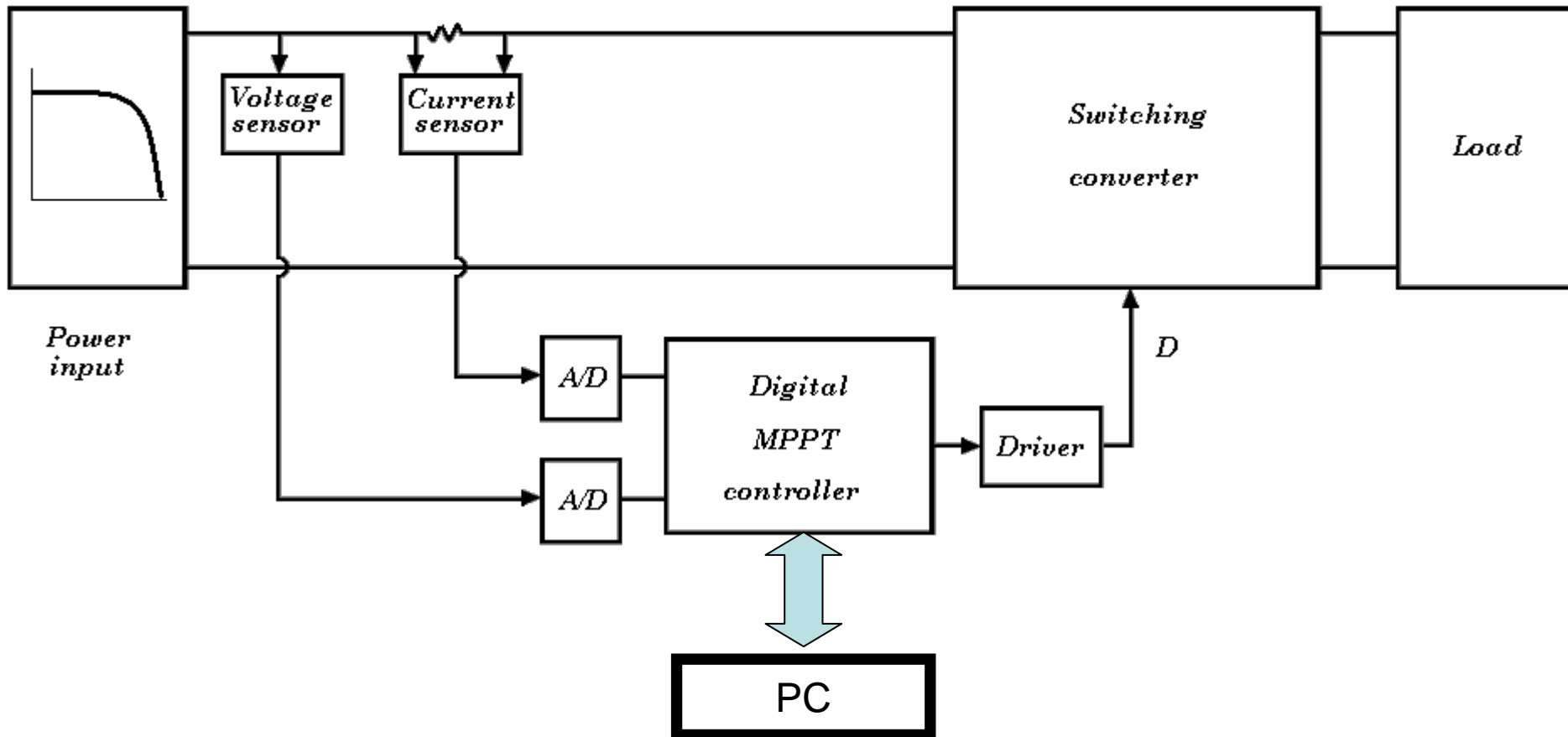


$P < 100W$

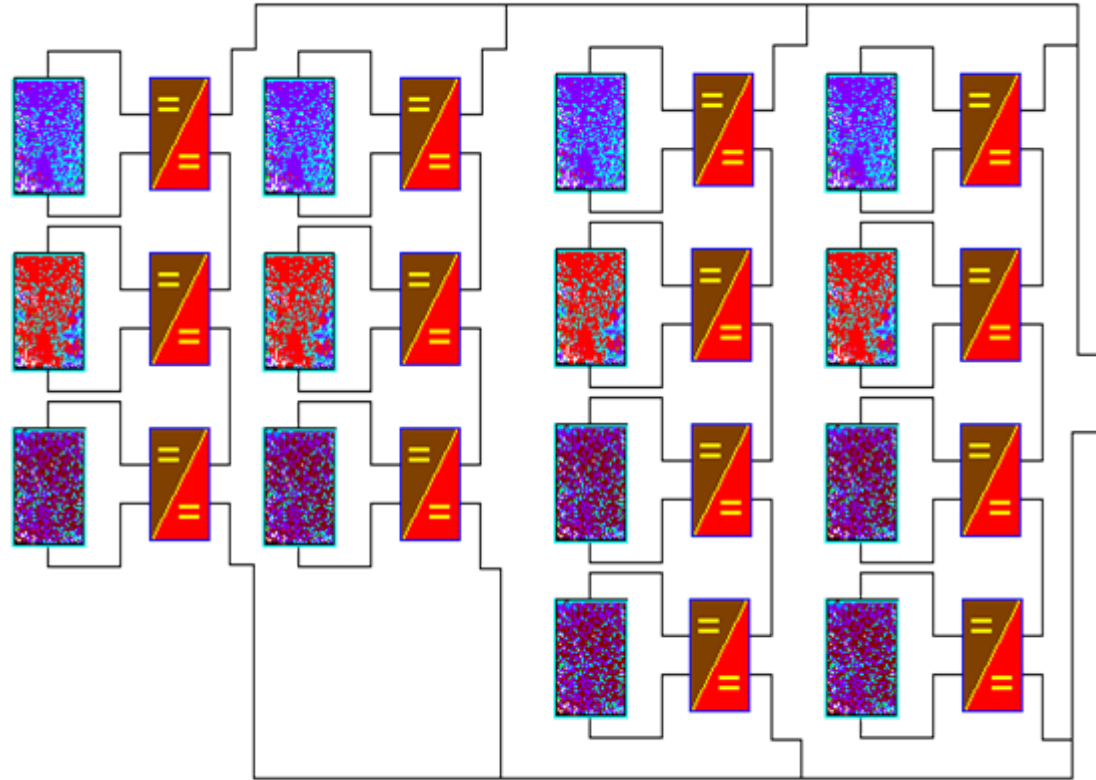
Convertitore a bassa tensione ed alta corrente: difficile progetto!!



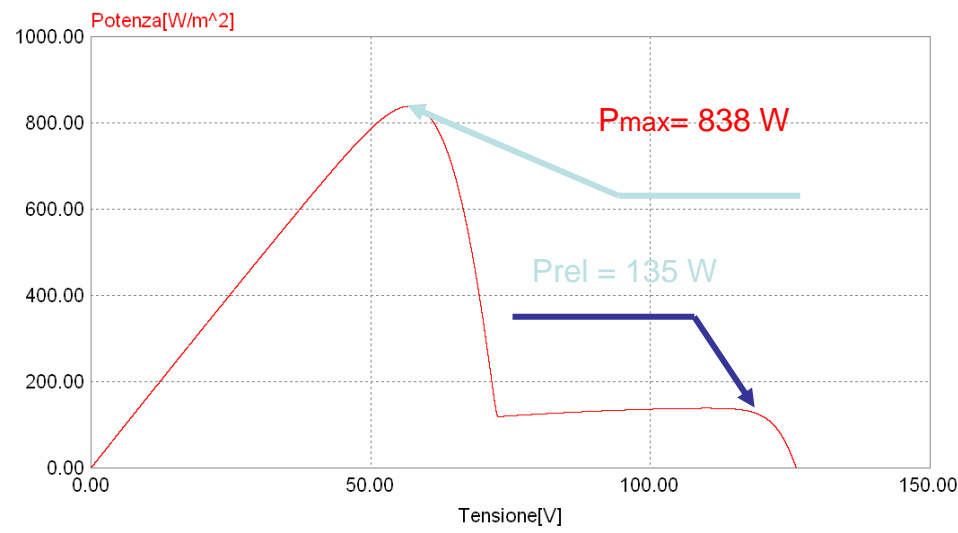
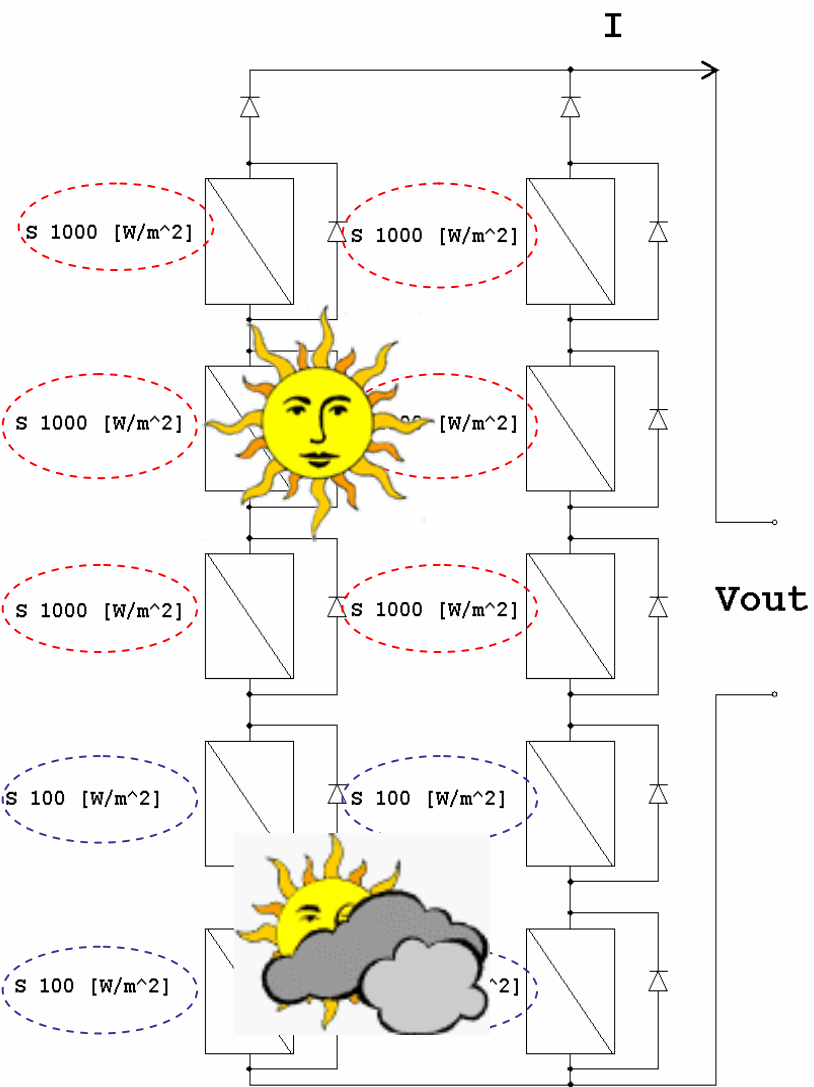
Struttura del convertitore per mppt



Architettura con mppt distribuito



Incremento di produttività in caso di mismatch



$$P_{tot} = \sum_{i=1}^n P_{max,i} = 6 \times P_{s1000} + 4 \times P_{s100} = 930 \text{ W}$$

$$\Delta P\% = -9,8\%$$

$$\Delta P\% = -85,4\%$$

