

FSc WOI: Economics of FF technologies (1)
(and alternative F)

The cost of lending/borrowing $\$ \equiv$ Interest (I)

The amt of $\$$ on which I is paid \equiv Principal (P)

\Rightarrow Interest rate \equiv % of I w/r to P over a specified time period.
(i)

$n \equiv$ # of interest periods (period)

$S \equiv$ amount owed/owned (principal + interest after period n)

(a) Simple interest: $I \equiv P \cdot i \cdot n$

$$S \equiv P + I = P(1 + (i \cdot n))$$

e.g., $S = 1000(1 + (0.10)(5)) = \1500

$\$ \left(\frac{\%}{yr} \right) (yrs)$

(b) Compound continuous interest: $S = P \exp(in)$

discrete interest: $S = P(1+i)^n$



Present worth: How much is future $\$$ worth today?

$$PW = P \exp(-in) \quad (\text{Continuous})$$

$$PW = P(1+i)^{-n} \quad (\text{Discrete})$$

At $i = 10\% / yr$
need $\$369$ today
to have $1K$ in $10yrs$

Check!