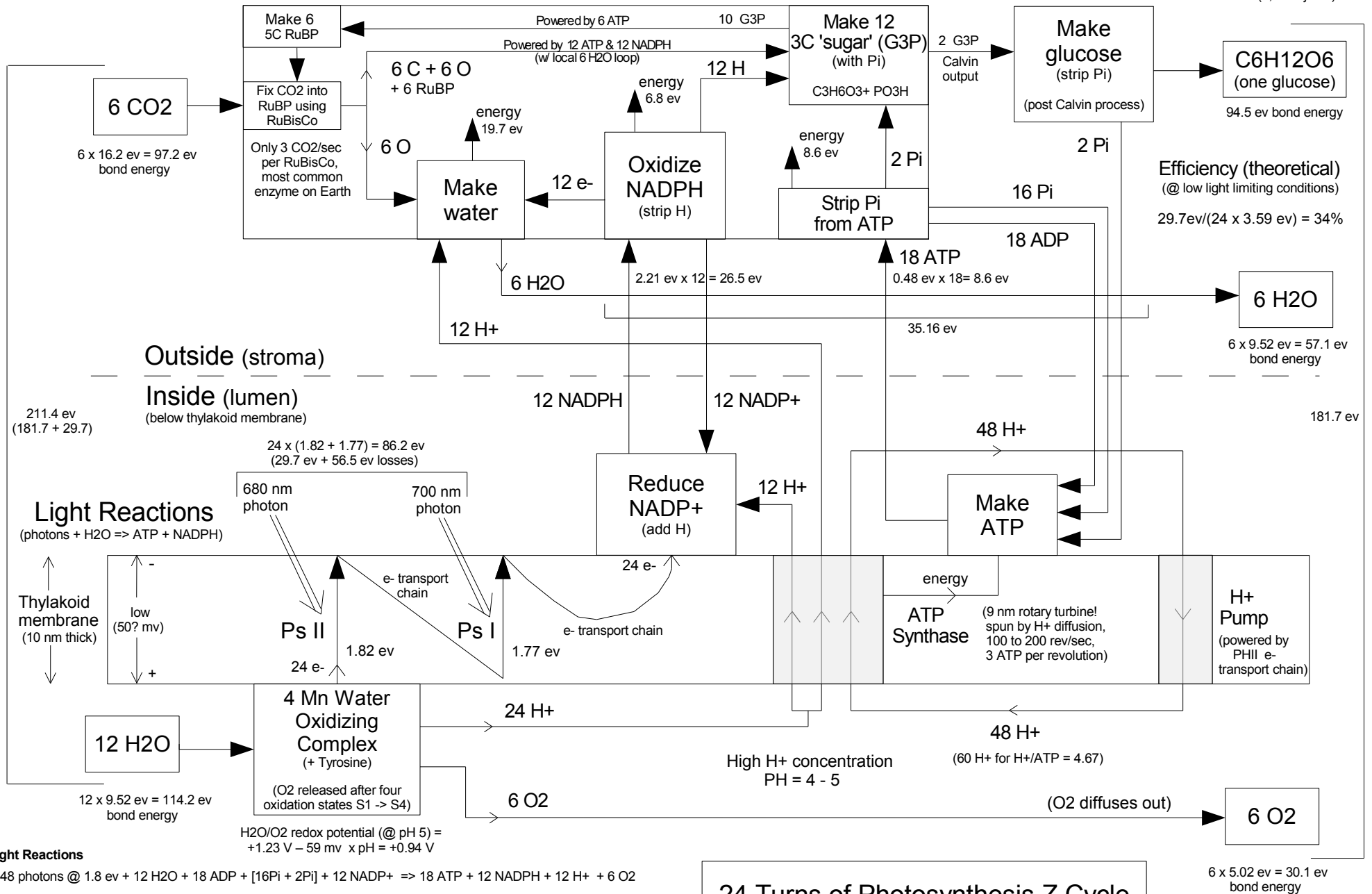


Dark Reactions -- Calvin cycle

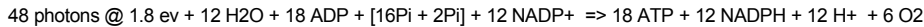
(NADPH + ATP power fixing of C + O from CO₂ into sugar)

$$\text{Dark Efficiency} = \frac{29.7 \text{ ev glucose}}{26.5 \text{ ev NADPH} + 8.6 \text{ ev ATP}} = 85\%$$

Glucose oxidation releases 29.7 ev (2,870 kJ/mol)



Light Reactions



Dark Reactions (unreduced)



where

NADPH = NADP⁺ + H⁺ + 2 e⁻ hydrogen & energy transport 2.21 ev
 ATP = ADP + Pi energy transport 0.48 ev (in cell)
 Pi = PO₃H (nom) phosphate group

24 Turns of Photosynthesis Z Cycle

Max efficiency at 200 uEinstein (10% full sunlight)
 200 photons/sec absorbed,
 10 msec/turn, 4 glucose/sec

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