A. Temperature:

$$cap_{Can}\dot{T}_{Can} = R_{PAR\_SunCan} + R_{NIR\_SunCan} + R_{PipeCan} - H_{CanAir} - L_{CanAir} - R_{CanCov,in} - R_{CanFlr} - R_{CanSky} - R_{CanThScr} \quad [\mathrm{W\ m^{-2}}] \quad (2.1)$$

$$cap_{Air}\dot{T}_{Air} = H_{CanAir} + H_{PadAir} + H_{MechAir} + H_{PipeAir} + H_{PasAir} + H_{BlowAir} + R_{Glob\_SunAir} - H_{AirFlr} - H_{AirThScr} - H_{AirOut} - H_{AirTop} - H_{AirOut\_Pad} - L_{AirFog} \quad [\mathrm{W\ m^{-2}}] \quad (2.2)$$

$$cap_{Flr}\dot{T}_{Flr} = H_{AirFlr} + R_{PAR\_SunFlr} + R_{NIR\_SunFlr} + R_{CanFlr} + R_{PipeFlr} - H_{FlrSo1} - R_{FlrCov,in} - R_{FlrSky} - R_{FlrThScr} \quad [\mathrm{W\ m^{-2}}] \quad (2.3)$$

$$cap_{So(j)}T_{So(j)} = H_{So(j-1)So(j)} - H_{So(j)So(j+1)} \qquad j = 1,2.....5 \quad [\mathrm{W\ m^{-2}}] \quad (2.4)$$

$$cap_{ThScr}\dot{T}_{ThScr} = H_{AirThScr} + L_{AirThScr} + R_{CanThScr} + R_{FlrThScr} + R_{PipeThScr} - H_{ThScrTop} - R_{ThScrCov,in} - R_{ThScrSky} \quad [\mathrm{W\ m^{-2}}] \quad (2.5)$$

$$cap_{Top}\dot{T}_{Top} = H_{ThScrTop} + H_{AirTop} - H_{TopCov,in} - H_{TopOut} \quad [\mathrm{W\ m^{-2}}] \quad (2.6)$$

$$cap_{Cov,in}\dot{T}_{Cov,in} = H_{TopCov,in} + L_{TopCov,in} + R_{CanCov,in} + R_{FlrCov,in} + R_{PipeCov,in} + R_{ThScrCov,in} - H_{Cov,inCov,e} \quad [\mathrm{W\ m^{-2}}] \quad (2.7)$$

$$cap_{Cov,e}\dot{T}_{Cov,e} = R_{Glob\_SunCov} + H_{Cov,inCov,e} - H_{Cov,eOut} - R_{Cov,eSky} \quad [\mathrm{W\ m^{-2}}] \quad (2.8)$$

$$cap_{Pipe}\dot{T}_{Pipe} = H_{BoilPipe} + H_{IndPipe} + H_{GeoPipe} - R_{PipeSky} - R_{PipeCov,in} - R_{PipeCan} - R_{PipeFlr} - R_{PipeThScr} - H_{PipeAir} \quad [\mathrm{W\ m^{-2}}] \quad (2.9)$$

B. Vapor pressure:

$$cap_{VP_{Air}}\dot{V}P_{Air} = MV_{CanAir} + MV_{PadAir} + MV_{FogAir} + MV_{BlowAir} - MV_{AirThScr} - MV_{AirTop} - MV_{AirOut} - MV_{AirOut\_Pad} - MV_{AirMech} \quad [\text{kg m}^{-2}\ \text{s}^{-1}] \quad (2.10)$$

$$cap_{VP_{Top}}\dot{V}P_{Top} = MV_{AirTop} - MV_{TopCov,in} - MV_{TopOut} \quad [\text{kg m}^{-2}\ \text{s}^{-1}] \quad (2.11)$$

C. CO2 concentration:

$$cap_{CO_2 Air}\dot{C}O_{2\,Air} = MC_{BlowAir} + MC_{ExtAir} + MC_{PadAir} - MC_{AirCan} - MC_{AirTop} - MC_{AirOut} \quad [\text{mg m}^{-2}\ \text{s}^{-1}] \quad (2.12)$$

$$cap_{CO_2 Top}\dot{C}O_{2\,Top} = MC_{AirTop} - MC_{TopOut} \quad [\text{mg m}^{-2}\ \text{s}^{-1}] \quad (2.13)$$