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# Nomenclature

| | |
|---|---|
| $\alpha$ | Seebeck coefficient (V/$^{o}$C) |
| $\rho$ | density of stove material (kg/m$^3$) |
| $\alpha_d$ | thermal diffusivity of the stove material (m$^{-2}$s$^{-1}$) |
| $\sigma$ | Stefan Boltzmann's constant (W/m$^2$.K$^4$) |
| $\epsilon_{flame}$ | emissivity of flame |
| $\varepsilon_{fb}$ | emissivity of fuel bed |
| $\varepsilon_{stove\ wall}$ | emissivity of combustion chamber outer wall |
| $\eta_{stove}$ | Efficiency of stove (%) |
| $\Delta T$ | Temperature difference between hot and cold side of TEG module ($^{o}$C) |
| $A_{cc}$ | area of combustion chamber inner wall (m$^2$) |
| $A_{flame}$ | area of the flame (m$^2$) |
| $A_{fb}$ | area of fuel bed (m$^2$) |
| $A_o$ | Outer wall combustion chamber area (m$^2$) |
| BE | Brayton Engine |
| CC | Combustion chamber |
| $C_p$ | Specific heat of stove material (J/kg.K) |
| $D_{cc}$ | Diameter of combustion chamber of stove (m) |
| $E_{meal}$ | energy consumed in preparation of a meal (MJ) |
| $F_{flame.cc}$ | view factor from flame to combustion chamber inner wall |
| $F_{fb.cc}$ | View factor from fuel bed to combustion chamber inner wall |
| $F_{cc\_potB}$ | View factor from CC inner wall to pot bottom |
| $F_{cost}$ | Cost of fuel per unit energy (US$/MJ) |
| h | Convective heat transfer coefficient inside combustion chamber (W/m$^2$.k) |
| $h_{amb}$ | convective heat transfer coefficient of ambient air (W/m$^2$.K) |
| I | current (A) |
| $I_{stove}$ | Cost of cooking stove (US$) |

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|---|---|
| $k_g$ | Thermal conductivity of flowing gas (W/m.K) |
| $k_{stove}$ | thermal conductivity of stove material (W/m.K) |
| K | Thermal conductance (W/m.K) |
| $K_d$ | decay coefficient ($m^{-1}$) |
| L | Length (or height) of the outer wall (m) |
| LCCM | Levelized cost of cooking a meal (US$) |
| LHV | Lower heating value of fuel (MJ/kg) |
| LPG | LPG cook stove |
| $m_g$ | air flux ($kg/m^2.s$) |
| $Meals_{total}$ | total number of meals prepared with cook stove |
| $Nu_L$ | Nusselt Number |
| $OM_{stove}$ | Operation and maintenance cost (US$) |
| $P_{TEG}$ | Power output from TEG module (W) |
| Pr | Prandtl Number |
| $Q_{conv.g}$ | Convective heat transfer from flowing gas (W) |
| $Q_{C\_TEG}$ | Heat rejected from the cold side of TEG module (W) |
| $Q_{cc\_potB}$ | Heat transferred from combustion chamber inner wall to pot bottom (W) |
| $Q_{H\_TEG}$ | Heat input to hot side of TEG module (W) |
| $Q_{flame.cc}$ | Radiative heat transfer from flame to combustion chamber inner wall (W) |
| $Q_{fb.cc}$ | Radiative heat transfer from fuel bed to combustion chamber inner wall (W) |
| $Q_{o\_amb}$ | Heat transfer from outer combustion chamber wall to surrounding (W) |
| $Q_{stored}$ | Heat stored by stove body (W) |
| $Ra_L$ | Rayleigh Number |
| r | discount rate (%) |
| R | Resistance (Ω) |
| S | Percentage weight of Sulphur in fuel (%) |
| $T_{amb}$ | Ambient air temperature (ºC) |
| $T_C$ | TEG module cold side temperature (ºC) |

| | |
|---|---|
| $T_f$ | Flame temperature (ºC) |
| $T_{fb}$ | Fuel bed temperature (ºC) |
| $T_{flame}$ | flame temperature (ºC) |
| $T_g$ | Flowing gas temperature inside stove combustion chamber (ºC) |
| $T_H$ | TEG module hot side temperature (ºC) |
| $T_{ig}$ | Ignition temperature (ºC) |
| $T_{potB}$ | Pot bottom temperature (ºC) |
| $T_{w,i}$ | Combustion chamber inner wall temperature (ºC) |
| $T_{w,o}$ | Combustion chamber outer wall temperature (ºC) |
| RC | Rankine Cycle |
| SE | Stirling engine |
| TBCS | Traditional biomass cook stove |
| TEG | Thermoelectric Generator |
| TIFICS | TEG integrated fixed clay stove |
| V | voltage generated by TEG module (V) |
| x | thickness of the flame (m) |