EXAMPLE 1-4 Electric Heating of a House at High Elevation

Modelica code

```modelica
model Example_1_4 "Electric Heating of a House at High Elevation"
  import Modelica.SIunits;
  import Modelica.SIunits.Conversions;
  import Modelica.SIunits.Conversions.NonSIunits;

  constant Real R = 287 "Gas constant ((Pa m^3)/(Kg K))";

  parameter SIunits.Area                                    A(min=0) =          200 ;
  parameter SIunits.Length                                  L(min=0) =          3;
  parameter SIunits.Pressure                                P_atm(min=0) =      84600;
  parameter NonSIunits.Temperature_degC                     T1(min=-273.15) = 10;
  parameter NonSIunits.Temperature_degC                     T2(min=-273.15) = 20;
  parameter SIunits.SpecificHeatCapacityAtConstantPressure cp(min=0) =          1007;
  parameter Real                                            cost_e(min=0) =   0.075;

  output SIunits.SpecificHeatCapacityAtConstantVolume cv;
  output SIunits.Volume                                V       "Volume (m^3)";
  output SIunits.TemperatureDifference                dT      "Temp. difference (C)";
  output SIunits.Mass                                 m       "Mass (Kg)";
  output SIunits.Energy                               E_cte_v "Energy (J)";
  output SIunits.Energy                               E_cte_p "Energy (J)";
  output Real                                         cost_v  "Cost (dollar)";
  output Real                                         cost_p  "Cost (dollar)";

equation
  V       = A*L;
  m       = P_atm*V/(R*Conversions.from_degC(T1));
  cv      = cp - R;
  dT      = T2-T1;
  E_cte_v = m*cv*dT;
  E_cte_p = m*cp*dT;
  cost_v  = E_cte_v*cost_e/(3600*10^3);
  cost_p  = E_cte_p*cost_e/(3600*10^3);

end Example_1_4;
```