# NOMENCLATURE INFORMATION OF TIME PROFILE CSV FILES

## 1 Introduction

The time profiles available for Soria are located in the folder "*.\StoRIES_RefCase_Config_rev04_input*" in CSV format.

The format consists of 2 columns, the first one being the time in seconds.

There are 4 types of CSV:

1. P_base electric profile. The second column represents electrical power in kW
2. P_base thermal profile. The second column represents thermal power in kW
3. nu profile. The second column represents efficiency in p.u.
4. epz. The second column represents the cost €/kW.h of the purchased energy, and the third column represents the selling price in €/kW.h.

*Note: the CSV epz has a first row of text values with the name of the variables, while the rest of CSV start in the first line with numerical values.*

To know what type of subsystems or blocks of the model that use each profile, the INFO tab of the configuration file "StoRIES_RefCase_Config_rev04.xlsx" (hereinafter, **configuration file**) can be consulted. If in parameters 9, 11, 13, or 18 an 'x' appears, it means that said subsystem uses a time profile of type P_base electric profile, P_base thermal profile, nu profile or epz, respectively (and on the contrary, if an "N/A" appears, it means that it does NOT use said time profile). In the figure 1 this parameters are remarked in blue.

*Note: type of subsystem or model in not the subsystem; in the model there are several subsystems of the same type of subsystem. The type of subsystem is described in "Class Name" (line 8 in CONFIG Sheet). In the figure 1 the "class name" is remarked in orange.*

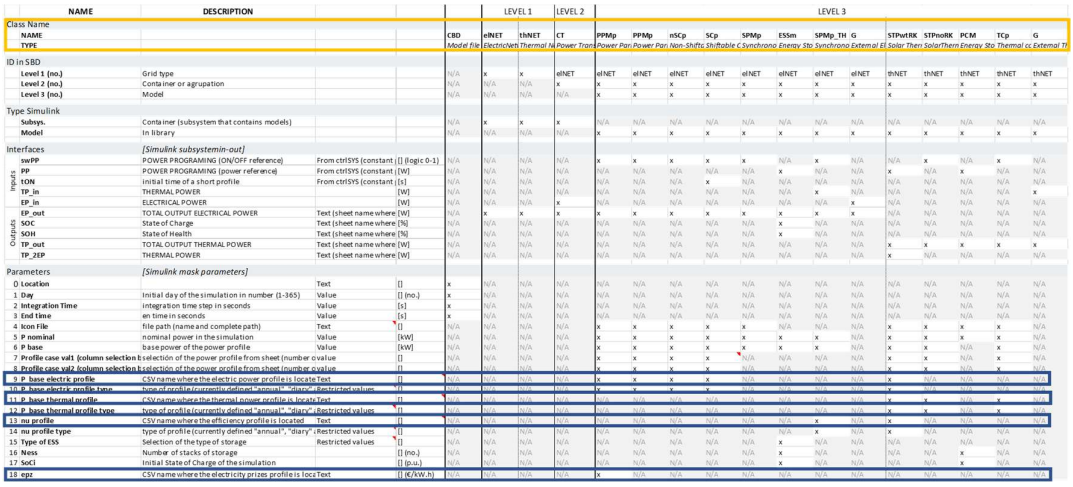

*Figure 1: CONFIG tab of **configuration file**.*

## 2 How is define the CSV used by each Simulink subsystem

The CSV name used by a subsystem is composed as follows:

| **TP_[Location]_[CSV_name]_[ Profile case val1]_[ Profile case val1].csv.** |
|---|
| **[Location]** - is the location chosen for the case to be analyzed and the value of "parameter 0" or "Location" of the "Model File" is taken. For example, it is the value of cell **D20** of the **CONFIG** tab of the configuration file. |
| **[CSV_name]** - is the name of the time profile, and appears, for each column or subsystem, in parameters 9, 11, 13, or 18 an 'x' appears, is that such subsystem uses a time profile of type P_base electric profile, P_base thermal profile, nu profile or epz, respectively. For example, in the CONFIG tab of the configuration file it can be seen that for the subsystem named "WG - PPMp" (name cell L7), the value of parameter 9 (cell L29) is "WG_Pe". |

**[Profile case val1]** and **[ Profile case val1]** - are the values with which the "option" or profile case is defined. These values appear in parameter 7 and parameter 8 respectively. When there is only one option, it takes the values of 1 and 1. When there are more options, a comment has been included in the cells of the parameters.

*For example, for the subsystem named "Ctbu - TCp", parameter 7 has a comment indicating:*

*Vector of type of consumption:*

*1 - Hospital ENEA summer [W]*

*2 - Hospital ENEA winter [W]*

*3 - Offices ENEA summer [W]*

*4 - Offices ENEA winter [W]*

*5 - Hotel ENEA summer [W]*

*6 - Hotel ENEA winter [W]*

*7 - Industries ENEA [W]*

*8 - Residential ENEA [W]*

*This assumes that the model "Ctbu - TCp" uses the named csv:*
***TP_Soria_CtBu_Pt_008_001.csv** ->*

- ***Cell D20**; Parameter 0 Location of CBD-> **Soria***
- ***Cell Z31**; Parameter 11 P_base thermal profile of Ctbu - TCp -> **CtBu_Pt***
- ***Cell Z27**; Parameter 7 Profile case val1 (column selection by case) from Ctbu - TCp for a type of profile "residential -> **8***
- ***Cell Z28**; Parameter 8 Profile case val2 (column selection by sub-case) of Ctbu - TCp -> **1***

# 3 How the parameter DAY affects to the time profile used by Simulink model

There are different types of profiles:

- CSV types 1-3 can be annual, daily, or short profiles.
- CSV type 4 (epz - electricity price) is always an annual type.

The profile type is defined in parameters 10, 12 and 14 for P_base electric profile, P_base thermal profile and nu profile, respectively.

In case of annual profiles, the XlsCsv2yaml.m script reads the entire CSV, but extracts the information of the day defined in "parameter 1" "Day" (i.e., it is the value of cell D21 of the CONFIG tab of the configuration file).

Thus, the XlsCsv2yaml.m script generates a single day profile, which is the one that appears in the yaml file.

This implies that changing the value of "parameter 1" "Day" implies a change in the profiles, as long as these profiles are of annual type.

In addition, in case of short profiles, the XlsCsv2yaml.m script reads the CSV and compose a diary profile completing with 0 the rest of the time profile and taking into account the initial time of each short profile. This initial time is defined in the CSV of the control information that is received from the Optimization.

| Time | WG_PPMp_swPP | PV_PPMp_swPP | Cbu_NSCp_swPP | CEV_SCp_swPP | CPI_SCp_swPP | BAT_ESSm_PP | SC_ESSm_PP | HP_ESSm_PP | CSP_MS_STPwtRK_PP | RC_SPMp_swPP | TPS_MS_STPnoRK_swPP | PCM_ESS_PP | Ctbu_TCp_swPP | CEV_SCp_tON | CPI_SCp_tON |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 1 | 1 | 1 | 1 | 2481119261 | 344569037 | 2712260809 | 0 | 0 | 1 | 10000 | | 3600 | 2520 |
| 3600 | 1 | 1 | 1 | 1 | 1 | 2460715649 | 7226965845 | 2923761873 | 0 | 0 | 1 | 10000 | | 28800 | 6840 |
| 7200 | 1 | 1 | 1 | 1 | 1 | 228063631 | 9788881579 | 2682874639 | 0 | 0 | 1 | 10000 | | 39600 | #¡NUM! |
| 10800 | 1 | 1 | 1 | 1 | 1 | 1728898404 | -2407089894 | 2218815597 | 0 | 0 | 1 | 10000 | | 79200 | #¡NUM! |
| 14400 | 1 | 1 | 1 | 1 | 1 | 1681843309 | 1342422648 | 15421581S | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 18000 | 1 | 1 | 1 | 1 | 1 | 1481484966 | -254231369 | 7039028305 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 21600 | 1 | 1 | 1 | 1 | 1 | 3384582027 | 4294715202 | -1213992971 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 25200 | 1 | 1 | 1 | 1 | 1 | -1581222032 | 3282473096 | -4757269567 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 28800 | 1 | 1 | 1 | 1 | 1 | -2777942217 | -4137748208 | -8981604673 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 32400 | 1 | 1 | 1 | 1 | 1 | -4310420549 | -1941748068 | -1008957276 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 36000 | 1 | 1 | 1 | 1 | 1 | -4887210218 | -1584025952 | -5730147226 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 39600 | 1 | 1 | 1 | 1 | 1 | -2791142161 | -1950764558 | -3555822758 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 43200 | 1 | 1 | 1 | 1 | 1 | -1334530543 | -1431332867 | -2108870631 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 46800 | 1 | 1 | 1 | 1 | 1 | 764018785 | 2473518449 | -2720131269 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 50400 | 1 | 1 | 1 | 1 | 1 | 2641589474 | -1947178303 | 3135379369 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 54000 | 1 | 1 | 1 | 1 | 1 | 3092891601 | 2008943505 | 1135264001 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 57600 | 1 | 1 | 1 | 1 | 1 | 2798832307 | 2202846417 | 1688145384 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 61200 | 1 | 1 | 1 | 1 | 1 | 2460171669 | -1339117413 | 1988394852 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 64800 | 1 | 1 | 1 | 1 | 1 | 1394180851 | -2816515957 | 2255744852 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 68400 | 1 | 1 | 1 | 1 | 1 | 3196991881 | -4840449328 | 1916919852 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 72000 | 1 | 1 | 1 | 1 | 1 | -288481383 | 6873606383 | 1820419852 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 75600 | 1 | 1 | 1 | 1 | 1 | -5785895297 | -3376072788 | 1386770916 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 79200 | 1 | 1 | 1 | 1 | 1 | -6770513718 | -8891608623 | 6407113412 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |
| 82800 | 1 | 1 | 1 | 1 | 1 | -743519037 | -2983852184 | 2561783625 | 0 | 0 | 1 | 10000 | | #¡NUM! | #¡NUM! |

*Figure 2: CSV with the control information in the current state (17/10/2024).*

*Note: in the main MATLAB script "ElectricSys_CEDERsimple01_cederDataIn_ExcelCSV2Sim.m", the part of the "future" XlsCsv2yaml.m function is corresponding to step 1.*

ElectricSys_CEDERsimple01_cederDataIn_ExcelCSV2Sim.m

```
1   clear all; restoredefaultpath %%%%%%%%%%%%%%%%
2   clearvars -except INstruct; restoredefaultpath
3   addpath('dataSim'); CIEMAT_EDLC_SC_load
4   addpath(genpath('auxFunc'))
5
6   %%
7   caseNm  = 'StoRIES_RefCase_Config_rev04';
8   MDLfile = 'ElectricSys_CEDERsimple01';
9   UTfile  = '';%'ElectricSys_CEDERsimple01_cederDataIn_uT_baseCase00.mat';
10  plotON  = 1;
11  cfgON   = 1;
12
13  INfile = [caseNm '.xlsx']; INdir = [caseNm,'_input']; OUTdir = [caseNm,'_output'];
14
15  %% STEP 1 - READ DATA FROM EXCEL
16  fprintf('**>> Loading data to workspace and generating YAML file<<**\n'); tic
17
18  [INstruct,OUTyamlNmTxt] = t32_RefCase_ReadCfg_4xlscsv2yalm(INfile,INdir,caseNm);%clear INstruct
19
20  fprintf(' DONE - elapsed time %05.3f s\n',toc)
21  %% STEP 2 - SIMULATION & DATA STORAGE
22  fprintf('**>> Reading YAML file, simulating case, and storing data in CSV and JSON files<<**\n'); tic
23
24  [out]=t32_RefCase_RunSlx_4yalm2out(OUTyamlNmTxt,OUTdir,MDLfile,cfgON,plotON,UTfile);
25
26  fprintf(' DONE - elapsed time %05.3f s\n',toc)
27
28  %% FUNCTION STEP 1
29  function [INstruct,OUTyamlNmTxt]=t32_RefCase_ReadCfg_4xlscsv2yalm(INfile,INdir,caseNm) ...
133 %%%%%%%%%>>>>> aux fun [t32_RefCase_ReadCfg_4xlscsv2yalm] <<<<<%%%%%%%%%%
134 function y = contain_(x,x_) ...
141 function y = str2num_(x) ...
149 function P_profVal = readTimeProf(P_profType,INfile,INstruct,mdlName,dayIN,t_Pvct,idxP) ...
176
177 %% FUNCTION STEP 2
178 function [OUTstruct,outNm]=t32_RefCase_RunSlx_4yalm2out(OUTyamlNmTxt,OUTdir,MDLfile,cfgON,plotON,UTfile) ...
252 %%%%%%%%%>>>>> aux fun [t32_RefCase_RunSlx_4yalm2out] <<<<<%%%%%%%%%%
253 function slxcfg_rst(mdl) ...
258 function [newConfigObj, cfg_nm_old] = slxcfg_new(mdl,cfg_nm_new) ...
266 function slxtst_ut(UTfile,out) ...
```

*Figure 3: Code of the main MATLAB script "ElectricSys_CEDERsimple01_cederDataIn_ExcelCSV2Sim.m"*