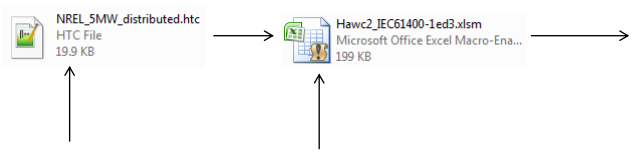
Load case implementation and Autogeneration of inputfiles

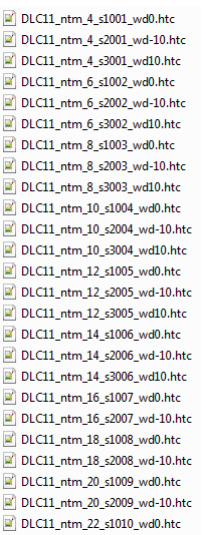
Risø DTU
National Laboratory for Sustainable Energy

Autogeneraton of inputfiles

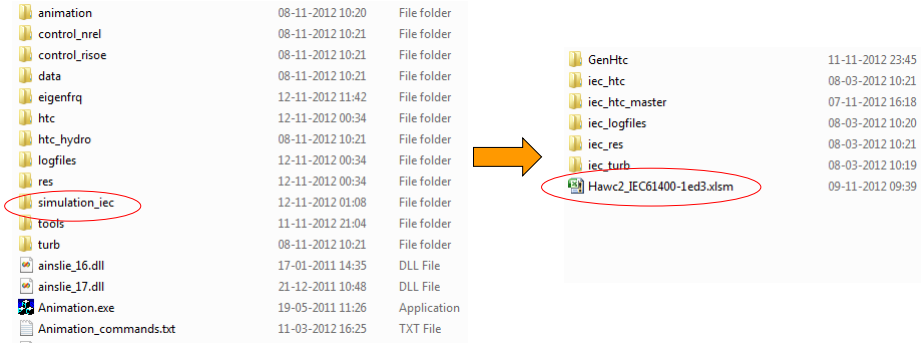


Define all variables
With [ ]

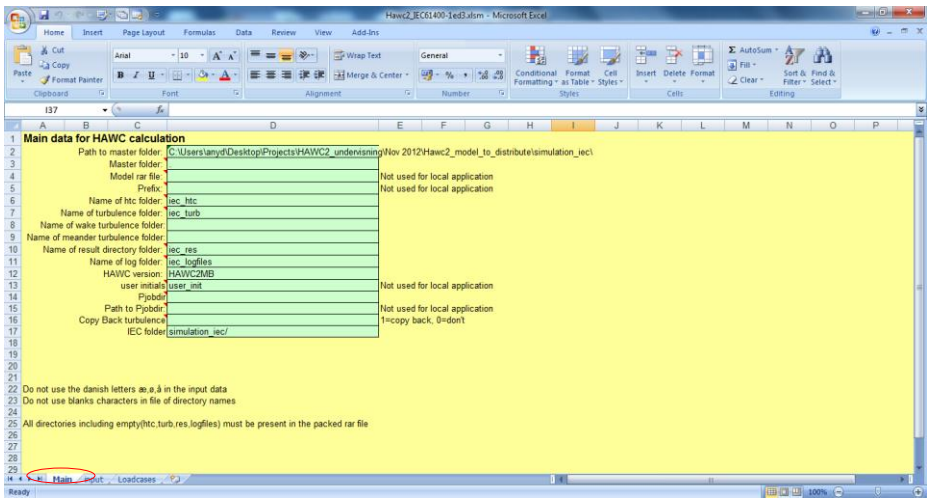
Set of all variables for each LC:
wsp,wdr,TI,t0,gusts, etc.



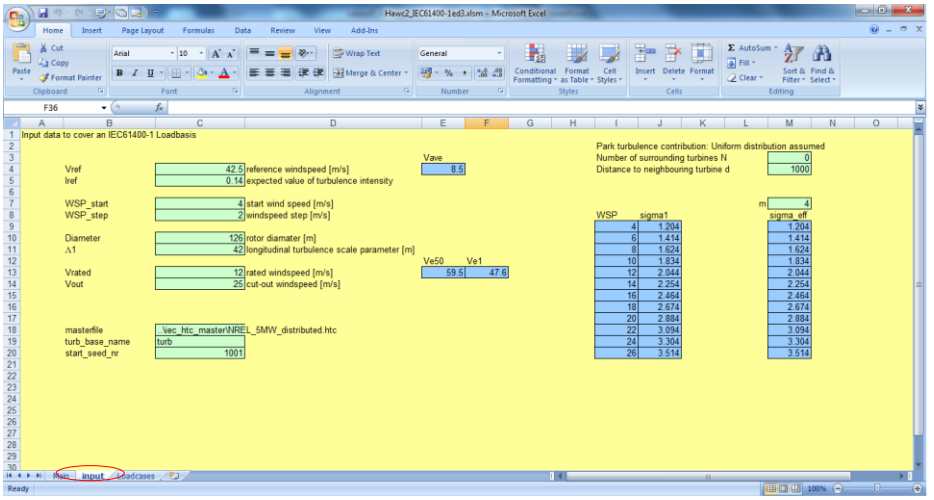
Excel Spreadsheet



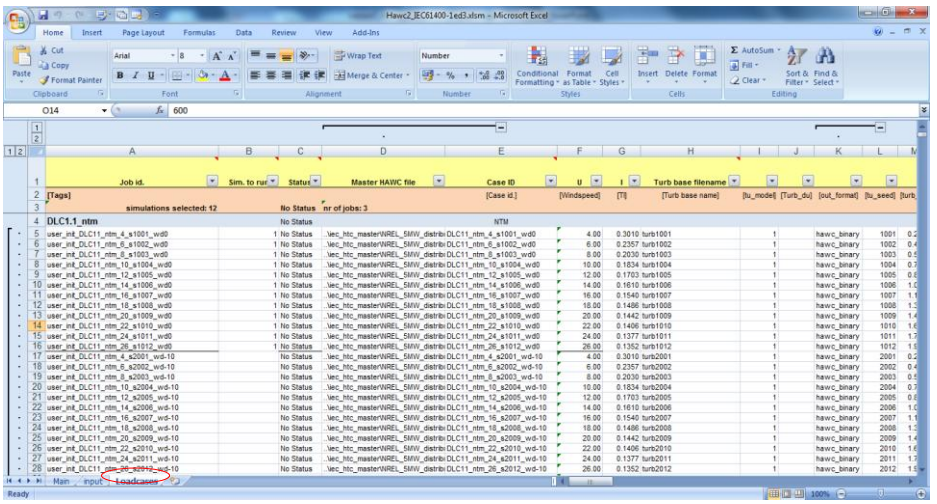
Spreadsheet input 1



Spreadsheet input 2



Spreadsheet input 3

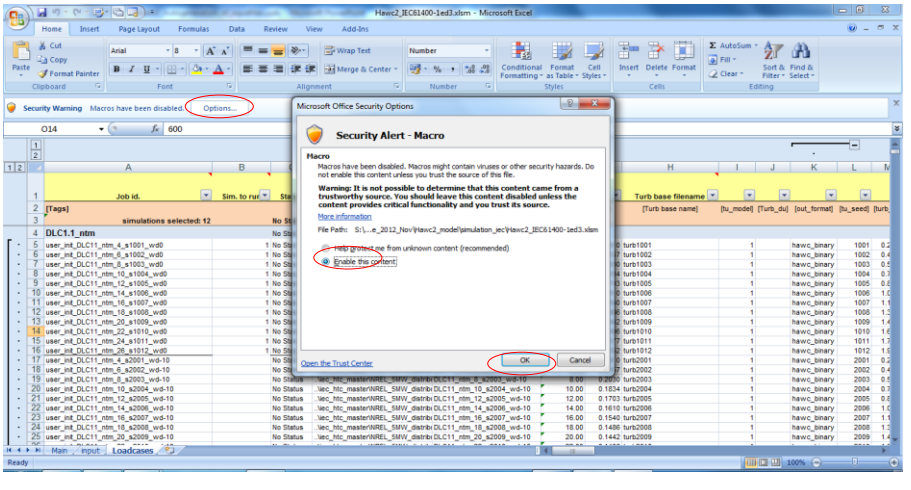


The format for the master.htc file

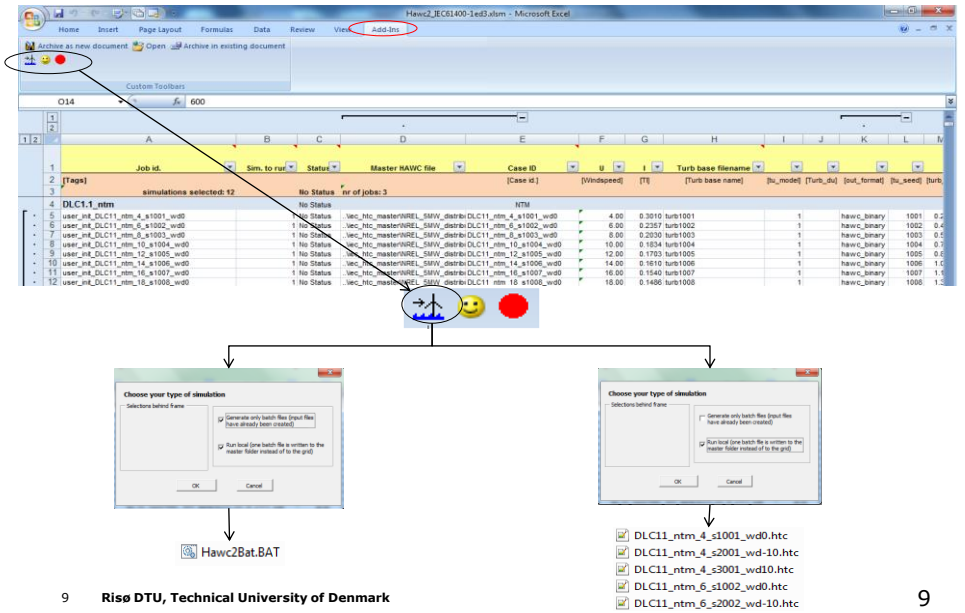
```
begin Simulation;
  time_stop    [time_stop]
  solvertype   1 ;    (newmark)
  on_no_convergence continue ;
  convergence_limits 1E3 1.0 0.7 ;
  logfile ./simulation_iec/iec_logfiles/[Case id.].log ;
;  animation ./iec_animation/[Case id.].dat;
;
  begin newmark;
    deltat    0.02;
  end newmark;
end simulation;
;
begin new_htc_structure;
;  beam_output_file_name  ./simulation_iec/iec_logfiles/[Case id.]_beam.dat;                Optional - Calculated beam properties of the bodies are written to file
;  body_output_file_name  ./simulation_iec/iec_logfiles/[Case id.]_body.dat;                Optional - Body initial position and orientation are written to file
;  body_eigenanalysis_file_name ./simulation_iec/iec_eigenfrq/[Case id.]_body_eigen.dat;
;  structure_eigenanalysis_file_name ./simulation_iec/iec_eigenfrq/[Case id.]_strc_eigen.dat;
;-----------------------------------------------------------------------------------------------------------------------------------------------------------
  begin main_body;        tower 87m
    name        tower ;
    type        timoschenko ;
    nbodies     1 ;
    node_distribution     c2_def ;
    damping_posdef   8.142E-04 8.14E-04 4.0E-03 4.3E-04 4.3E-04 4.3E-03 ; Mx My Mz Kx Ky Kz , M's raises overall level, K's raises high frequency level
     begin timoschenko_input;
      filename ./data/NREL_5MW_st.txt ;
      set 1 1 ;
    end timoschenko_input;
    begin c2_def;              Definition of centerline (main_body coordinates)
```


Generation of HTC´s & Bat file

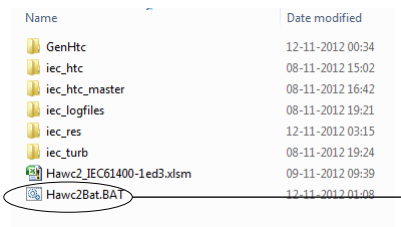
-Enable macros!



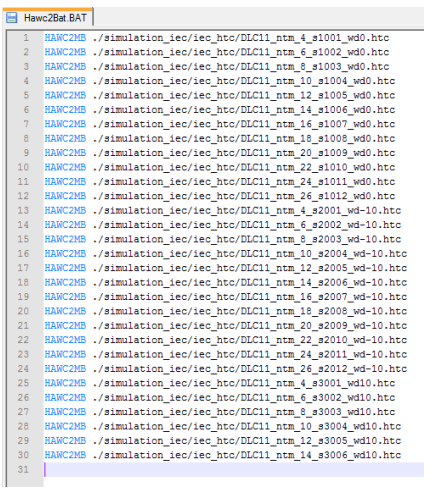
Generation of HTC´s & Bat file



HAWC2.Bat-file



Overnight simulations? Add "shutdown –s" in the end of your .bat-file to power off the computer after the simulation is finished



Parallel computing

PC

2-4 cores

Remember to run in parllel Folders!

Super computer

100-10000 cores

Quick guide

1. **Sheet: Main**
   -Enable macros
   -Setup of folder names to match your (
2. **Sheet: input**
   If covering the IEC61400-1 Load basis insert all values in the green cells from the standard.
3. **Sheet: Loadcases**
   Check all inputs and if you wish to remove any load cases clear the cells in row "Sim. to run".
   - Generate .bat-file: ->Click -> check both boxes ->"ok".
   - Gnerate all HTC-input files : ->Click -> check last box ->"ok".

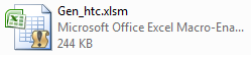
• remember to set decimal symbol to . in Windows (Control Panel\Clock, Language, and Region\Change the date, time, or number format\Format\additional settings)

Exercise

- **Ex1 Generate HTC & Bat - files**
  - Generate all the HTC-files from the load case spreadsheet
  - Check some of HTC-files and see if the right values are inserted?
  - Run a load case in HAWC2:
    - Start command promt in main folder and write: hawc2mb \simulation_iec\iec_htc\"loadcase name" or tab to browse files
  - Make initial assessments of the results using windap, does the results make sense?
- **Ex2 Run a bat file**
  - Create a bat-file contaning the 5 first loadcases and run it in HAWC2.
  - (move the bat-file to the main folder)

  -> to run a bat-file: Start command promt and write "name of bat-file"

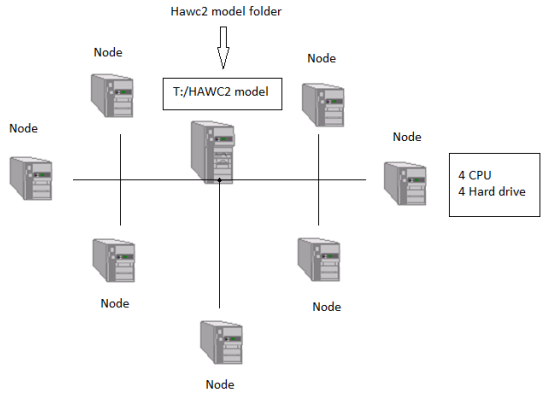
Ex3 – Create a set of loadcases

- Go to simulation_iec -> GenHtc -> 

- Create a set of loadcases with the following properties:

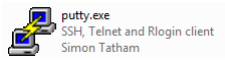
Load Case	Enabled DOF	Wind Conditions	Initial Conditions	duration
1.1	None	No air	Omega=0 rad/s	300 s
1.2	All	8 m/s	Omega=0.2 rad/s	400 s
1.3	All	12 m/s	Omega=0.5 rad/s	500 s
1.4	None	12 m/s	Omega=0.5 rad/s	500 s

Running HAWC2 on a cluster (thyra)

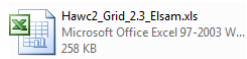


Running HAWC2 on a cluster (thyra)

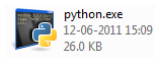
TPB (thyra parallel Batch)



Excel spread sheet



Python script



TPB (thyra parallel Batch)

1. Get acces to thyra (mail to Anne Margrethe Larsen [anla@risoe.dtu.dk])
2. Copy your hawc2 folder with .bat file to thyra (clean all output folders)
   -remember to add ”wine” when running on thyra (for linux applications)
3. Setup the input file (.txt) with all folders and informations etc.
4. Start putty.exe and login to thyra
5. Set up the folder to your input file (cd Hawc2)
6. Enter the inputfile

-status on all jobs : ”qstat”
-status on your jobs : ”qstat –u initials”
-delete a job: ”qdel [job id]”

• Good practice: don’t occupy the entire cluster!!