

Pre-workshop

1. Install OpenDSS - <https://sourceforge.net/projects/electricdss/files/latest/download>
2. For third session we would probably need
 - a. Python3 - a version appropriate - if 64 bit recommend 3.9 - Install the native GUI IDLE
 - b. After installing Python 3 please install CORRECT Version of Pywin to Match your Python version - <https://github.com/mhammond/pywin32/releases>
3. <https://sourceforge.net/p/electricdss/discussion/?source=navbar>

Workshop dynamic input

Clear

new circuit.4busDYBal basekV=12.47 phases=3 mvasc3=200000

! ** DEFINE WIRE DATA**

**new wiredata.conductor Runits=mi Rac=0.306 GMRunits=ft GMRac=0.0244 Radunits=in
Diam=0.721**

**new wiredata.neutral Runits=mi Rac=0.592 GMRunits=ft GMRac=0.00814 Radunits=in
Diam=0.563**

! ** DEFINE LINE GEOMETRY; REDUCE OUT THE NEUTRAL**

new linegeometry.4wire nconds=4 nphases=3 reduce=no

~ cond=1 wire=conductor units=ft x=-4 h=28

!~ cond=2 wire=conductor units=ft x=-1.5 h=28

~ cond=2 wire=conductor units=ft x=0 h=34

~ cond=3 wire=conductor units=ft x=3 h=28

~ cond=4 wire=neutral units=ft x=0 h=24

new line.line1 geometry=4wire length=2000 units=ft bus1=sourcebus bus2=n2

new transformer.t1 xhl=6

~ wdg=1 bus=n2 conn=delta kV=12.47 kVA=6000 %r=0.5

~ wdg=2 bus=n3 conn=wye kV=4.16 kVA=6000 %r=0.5

new line.line2 bus1=n3 bus2=n4 geometry=4wire length=25000 units=ft

**new load.load1 phases=3 bus1=n4 conn=wye kV=4.16 kW=5400 pf=0.9 model=1
set voltagebases=[12.47, 4.16]**

New XYCurve.MyPvsT npts=4 xarray=[0 25 75 100] yarray=[1.2 1.0 0.8 0.6]

```
New XYCurve.MyEff npts=4 xarray=[.1 .2 .4 1.0] yarray=[.86 .9 .93 .97]
New Loadshape.MyIrrad npts=24 interval=1 mult=[0 0 0 0 0 0 .1 .2 .3 .5 .8 .9 1.0 1.0 .99
.9 .7 .4 .1 0 0 0 0 0]
New Tshape.MyTemp npts=24 interval=1 temp=[25, 25, 25, 25, 25, 25, 25, 25, 35, 40, 45, 50
60 60 55 40 35 30 25 25 25 25 25 25]
```

```
New PVSystem.PV phases=3 bus1=n4 kV=12.47 kVA=500 irrads=1 Pmpp=500
~ temperature=25 PF=1 effcurve=MyEff P-TCurve= MyPvsT Daily= MyIrrad TDaily=
MyTemp
```

```
Calc voltage bases
solve
show voltages LL Nodes
show losses
```

```
*****Final code*****
```

```
Clear
```

```
new circuit.4busDYBal basekV=12.47 phases=3 mvasc3=200000
```

```
! **** DEFINE WIRE DATA
```

```
new wiredata.conductor Runits=mi Rac=0.306 GMRunits=ft GMRac=0.0244 Radunits=in
Diam=0.721
```

```
new wiredata.neutral Runits=mi Rac=0.592 GMRunits=ft GMRac=0.00814 Radunits=in
Diam=0.563
```

```
! **** DEFINE LINE GEOMETRY; REDUCE OUT THE NEUTRAL
```

```
new linegeometry.4wire nconds=4 nphases=3 reduce=no
```

```
~ cond=1 wire=conductor units=ft x=-4 h=28
```

```
!~ cond=2 wire=conductor units=ft x=-1.5 h=28
```

```
~ cond=2 wire=conductor units=ft x=0 h=34
```

```
~ cond=3 wire=conductor units=ft x=3 h=28
```

```
~ cond=4 wire=neutral units=ft x=0 h=24
```

```
new line.line1 geometry=4wire length=2000 units=ft bus1=sourcebus bus2=n2
```

```
new transformer.t1 xhl=6
```

```
~ wdg=1 bus=n2 conn=delta kV=12.47 kVA=6000 %r=0.5
```

```
~ wdg=2 bus=n3 conn=wye kV=4.16 kVA=6000 %r=0.5
```

new line.line2 bus1=n3 bus2=n4 geometry=4wire length=2500 units=ft

new load.load1 phases=3 bus1=n4 conn=wye kV=4.16 kW=5400 pf=0.9 model=1

New XYCurve.MyPvsT npts=4 xarray=[25 25 75 100] yarray=[1.2 1.0 0.8 0.6]

New XYCurve.MyEff npts=4 xarray=[.1 .2 .4 1.0] yarray=[.86 .9 .93 .97]

New Loadshape.MyIrrad npts=24 interval=1 mult=[0 0 0 0 0 0 .1 .2 .3 .5 .8 .9 1.0 1.0 .99
.9 .7 .4 .1 0 0 0 0 0]

New Tshape.MyTemp npts=24 interval=1 temp=[25, 25, 25, 25, 25, 25, 25, 25, 35, 40, 45, 50
60 60 55 40 35 30 25 25 25 25 25 25]

New PVSystem.PV phases=3 bus1=n4 kV=4.16 kVA=2000 irrads=1 Pmpp=2000
~ temperature=25 PF=1 effcurve=MyEff P-TCurve= MyPvsT Daily= MyIrrad TDaily=
MyTemp

new monitor.PVmon PVSystem.PV 1 mode=0 ppolar=yes

set mode=daily stepsize=1h number=24

set voltagebases=[12.47, 4.16]

Calc voltagebases

solve

show voltages LL Nodes

show losses

Show Powers kva Elements

plot Loadshape Object=MyIrrad

Export monitors PVmon

Plot monitor object= PVmon channels=(1)

!show voltages LL Nodes

!Show Powers kva Elements

*****Python_*****

import win32com.client

from win32com.client import makepy

```

import sys
import gc
import time
import os
import csv
import random
# Initialize OpenDSS (early binding)
sys.argv = ["makepy", "OpenDSSEngine.DSS"]
makepy.main()
DSSObj = win32com.client.Dispatch("OpenDSSEngine.DSS")
DSSText = DSSObj.Text
if DSSObj.Start(0) == False:
    print ("DSS Failed to Start") #11
DSSObj.ClearAll()
DSSText.Command = r'Set Datapath= (C:\UserData\z004rd0f\OneDrive - Siemens
AG\Documents\Teaching\OpenDSS workshop 3hr 2023)' # replace by YOUR path
DSSText.Command=r'compile python_ex1.dss ' # replace by YOUR file name

```

***** PV size from 1 kW to 10000 kW, find voltage and system losses and plot

```

A = "New PVSystem.PV phases=3 bus1=n4 kV=12.47
kVA=" + str(kva)+ " irrads=1.0 "+ "Pmpp="+ str(kva)+ "
temperature=25 PF=1 effcurve=Myeff
P-TCurve=MyPvsT Daily=PV_1-Day TDaily=MyTemp "
DSSText.Command=A

```