Energy planning for climate change using R, StarCluster and Shiny

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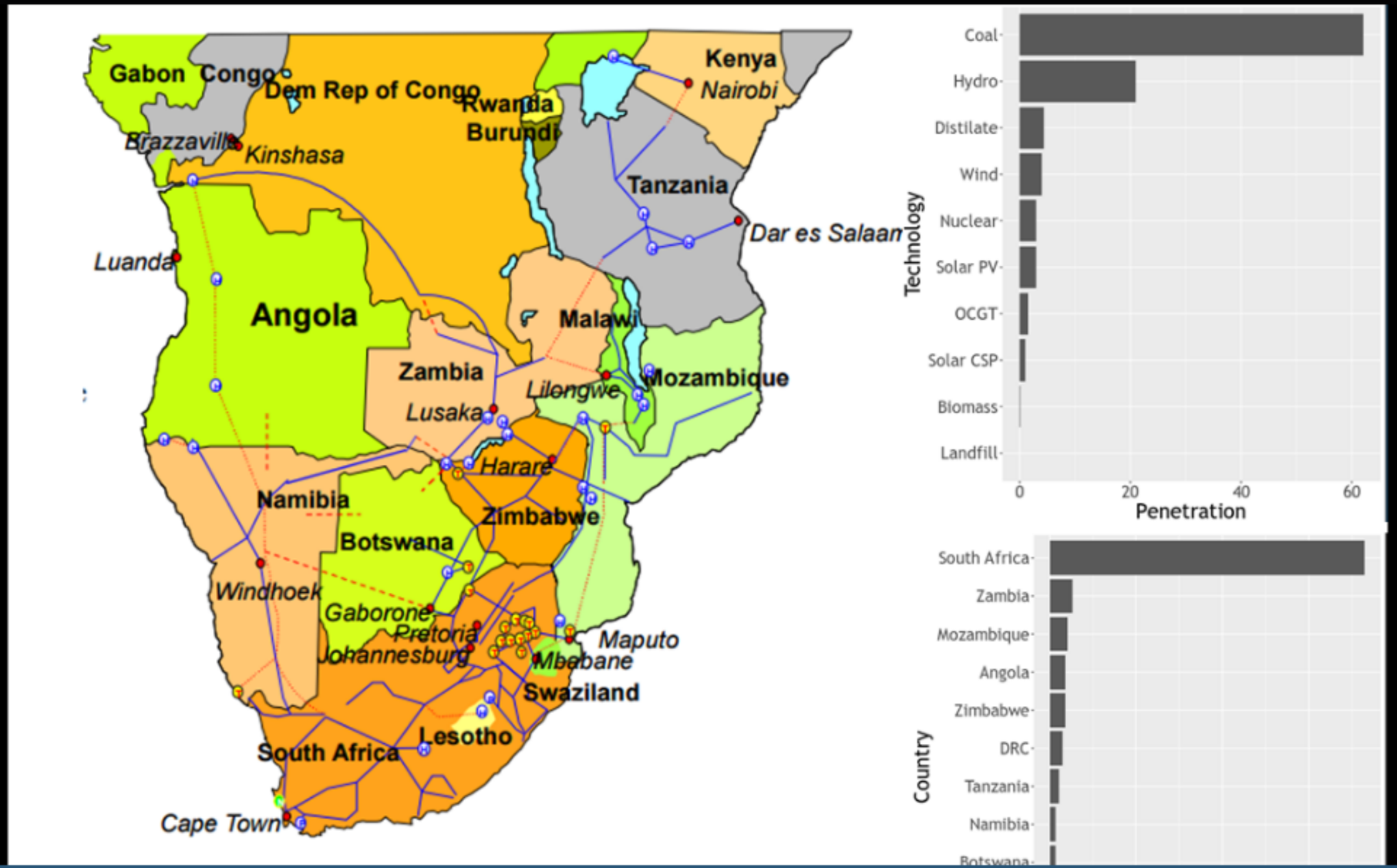
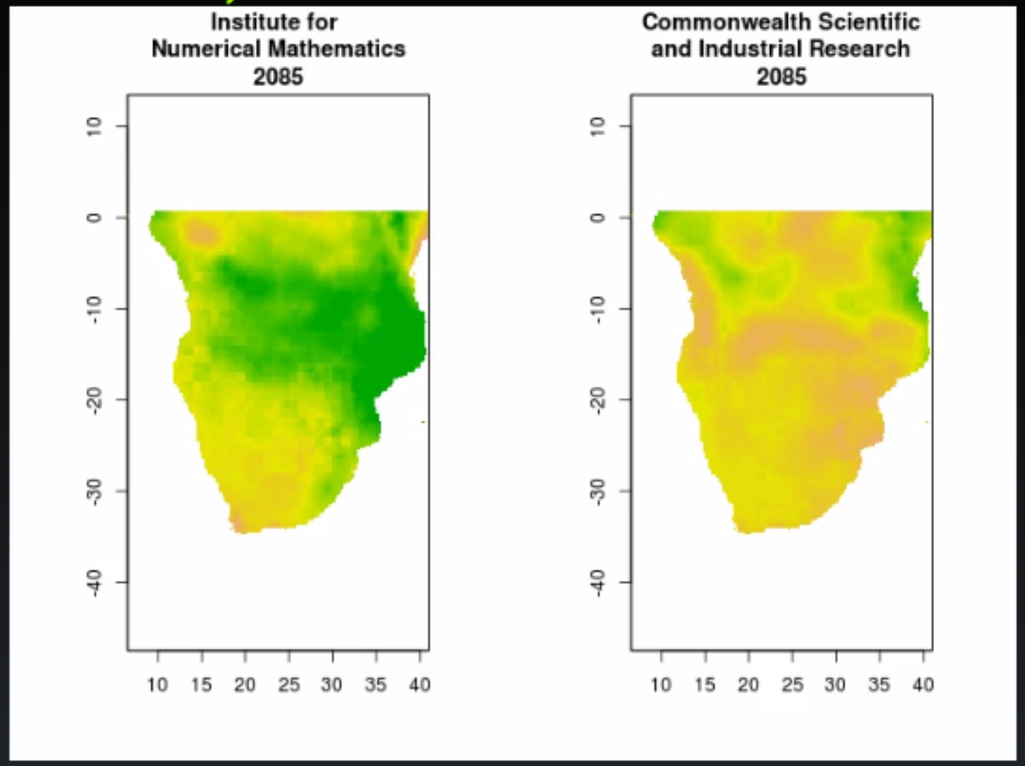
Long Term Electricity Planning



Uncertainties

Rainfall (21 GCM's with two RCPs)



+ Adaptation(5 SSP) + Power System (27) + Trading (5) = 15 487 scenarios

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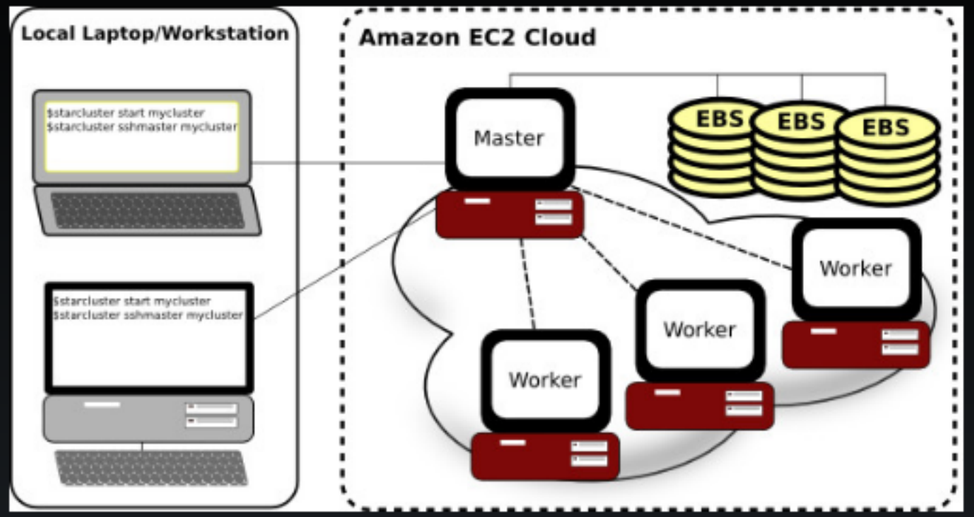
StarCluster (http://star.mit.edu/cluster/)



Software Tools for Academics and Researchers

- Scripted EC2 compute cluster
- Manage placement, permissions and host names
- Based on Ubuntu AMI, pre-installed R, Spark etc.
- Installs and configures
  - Oracle Grid Engine
  - Network File Share
  - Plugins: e.g. spark

Using StarCluster with R (qsub)


```
lapply(1:15487, function(i) {
  cmd <- "qsub -S /usr/bin/Rscript /nfs/run.r %d"
  system( sprintf(cmd,i) )
})
```

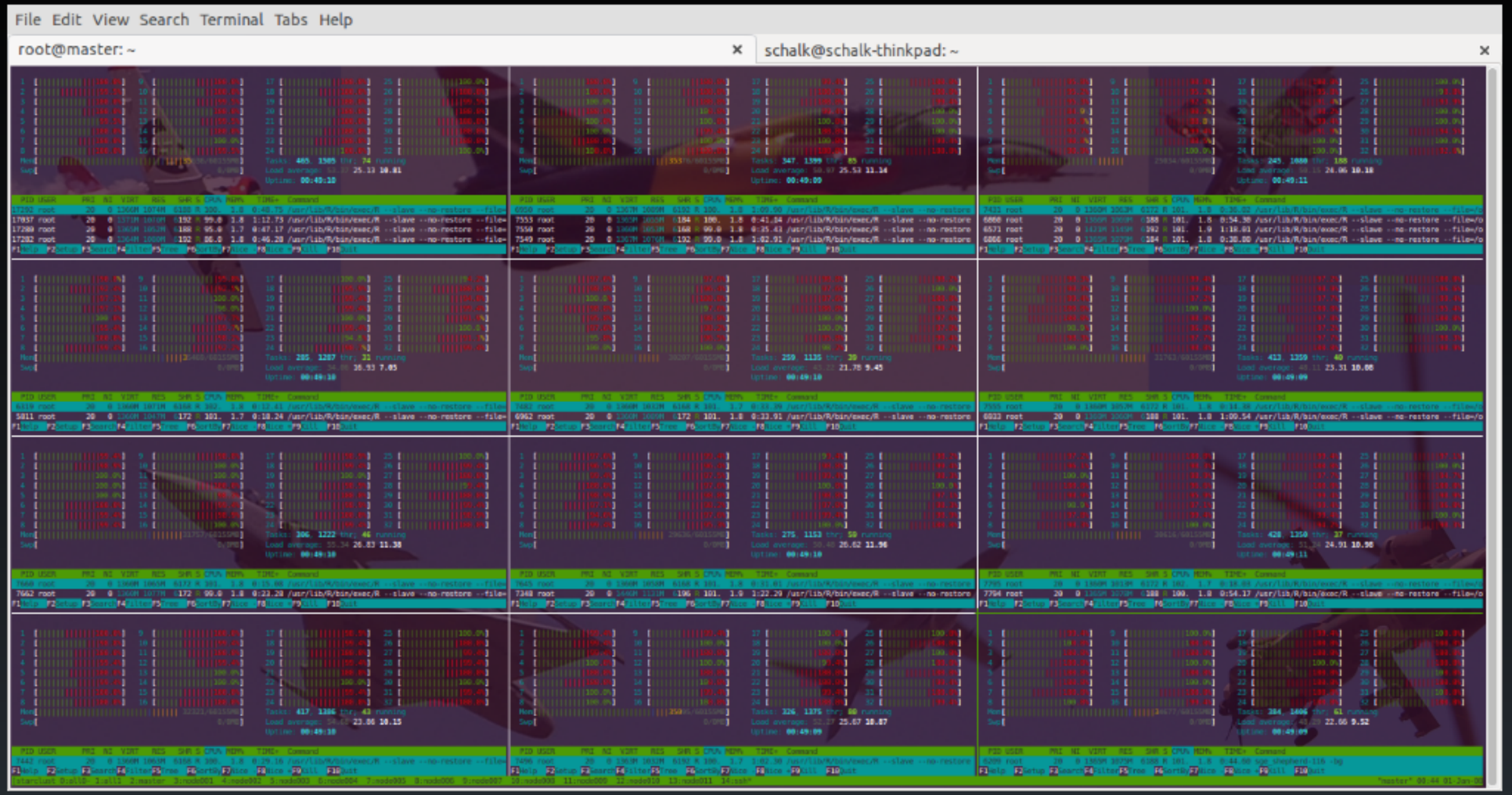
run.r

```
#!/usr/bin/Rscript
i <- commandArgs(TRUE)
result <- balance.supply.and.demand.scenario(i)
fn <- sprintf("/nfs/%d.rdata",i)
save(result, file=fn)
```

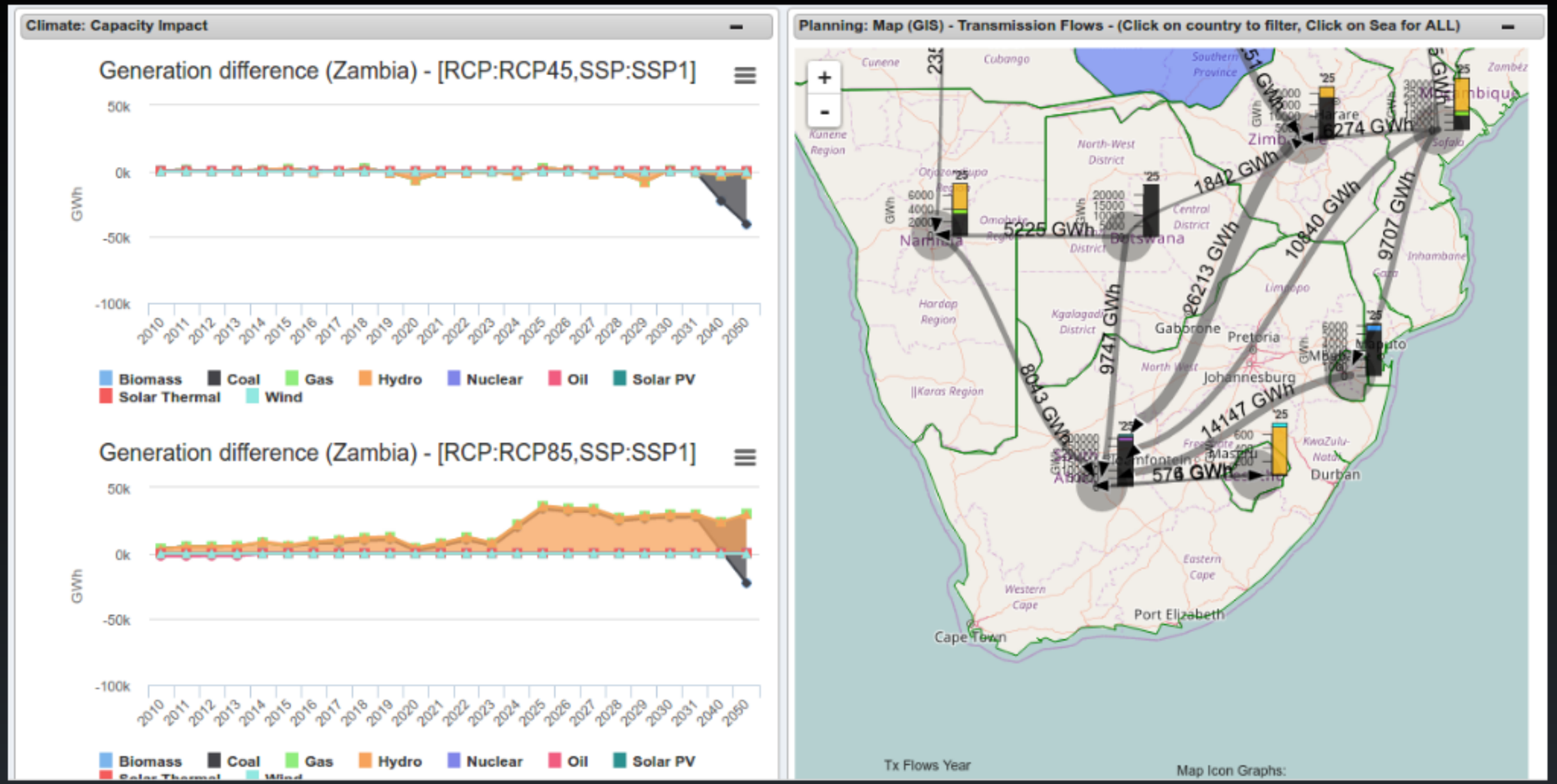
Using StarCluster with R (sparkR)


```
run.r <- function(i){
  result <- balance.supply.and.demand.scenario(args)
  fn <- sprintf("/nfs/%d.rdata",i)
  save(result, file=fn)
}
spark.lapply(1:15487,run.r)
```

Processing...


File Edit View Search Terminal Tabs Help
root@master: ~
schalk@schalk-thinkpad: ~

Decisions under uncertainty



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