

Closing the Deal on the Smart Grid

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Living in the Interesting Time

1883→ 1990

Control Through Angular Momentum



Reliability through overbuilding

2025?→ ∞∞

Analytically Driven Control

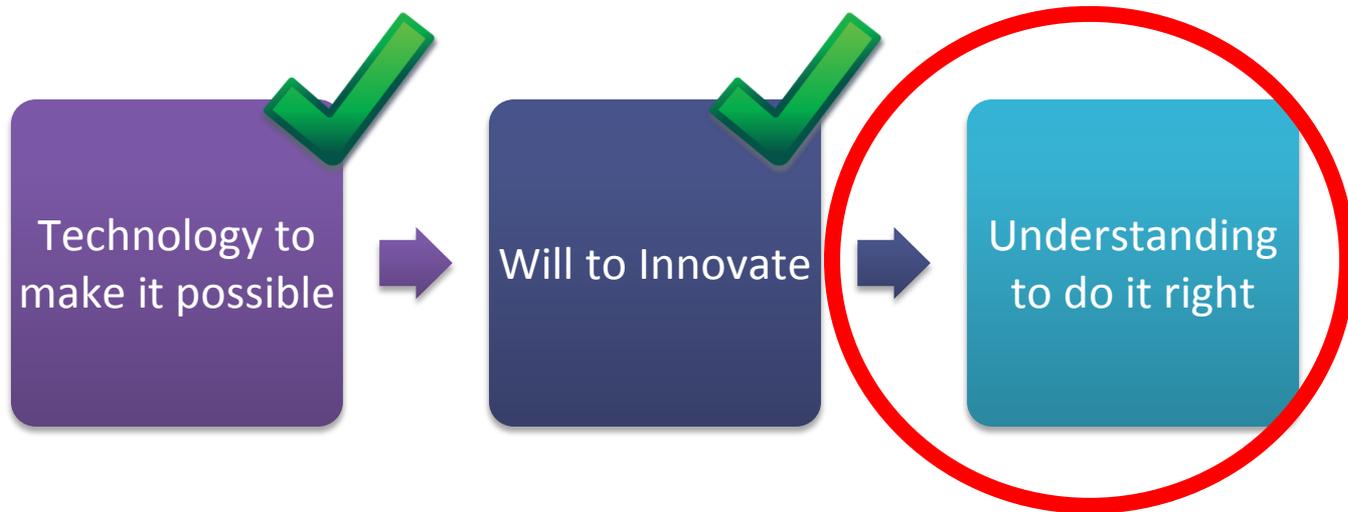


Knowledge of state
Precise control
High performance analytics

Transition

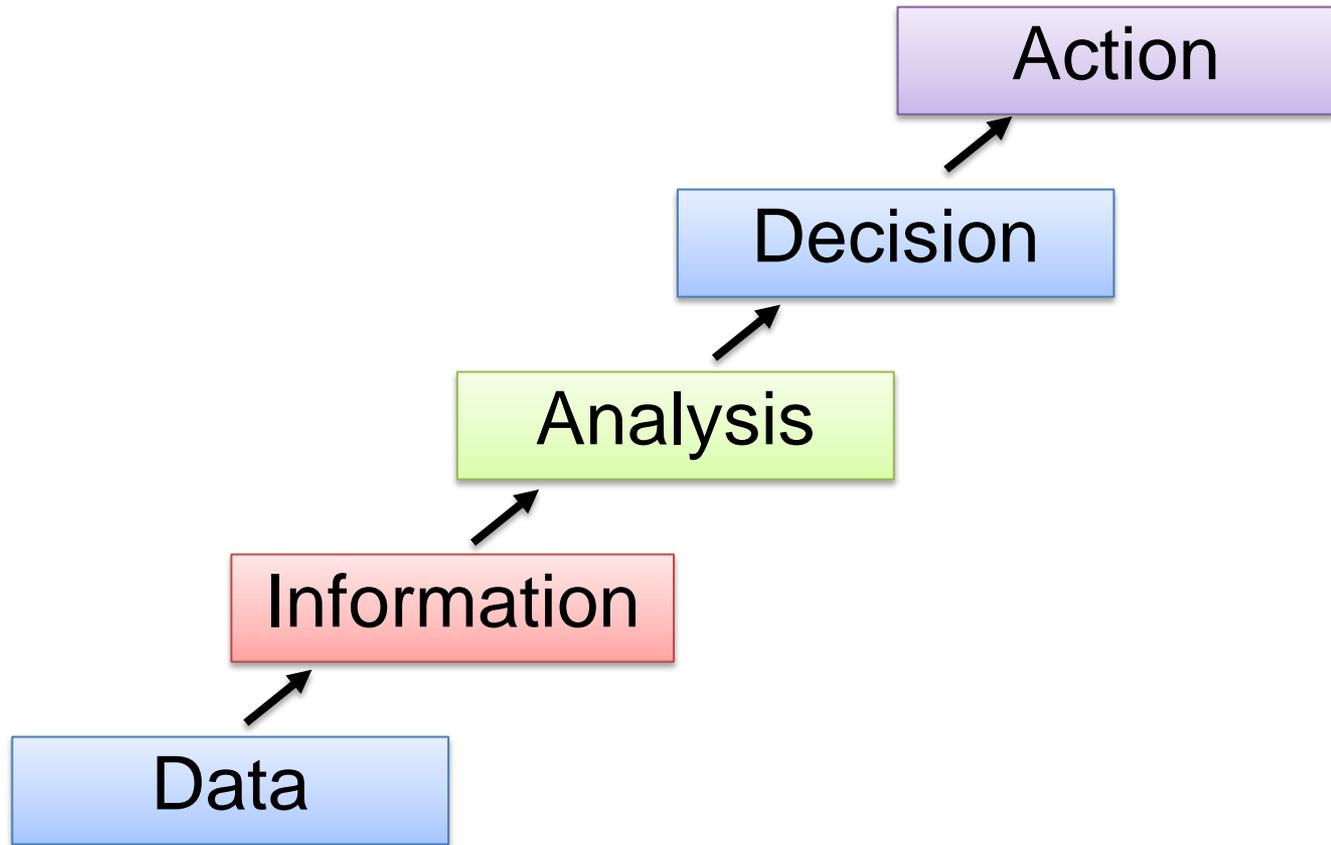
Lack of overall model
Changing Technology
Complicated Transition

Realizing the Smart Grid – Post ARRA



Accurate Analytics
Planning leading to Operations
Aligned with utility needs and processes
Made cheaper and easier

Abstraction Model



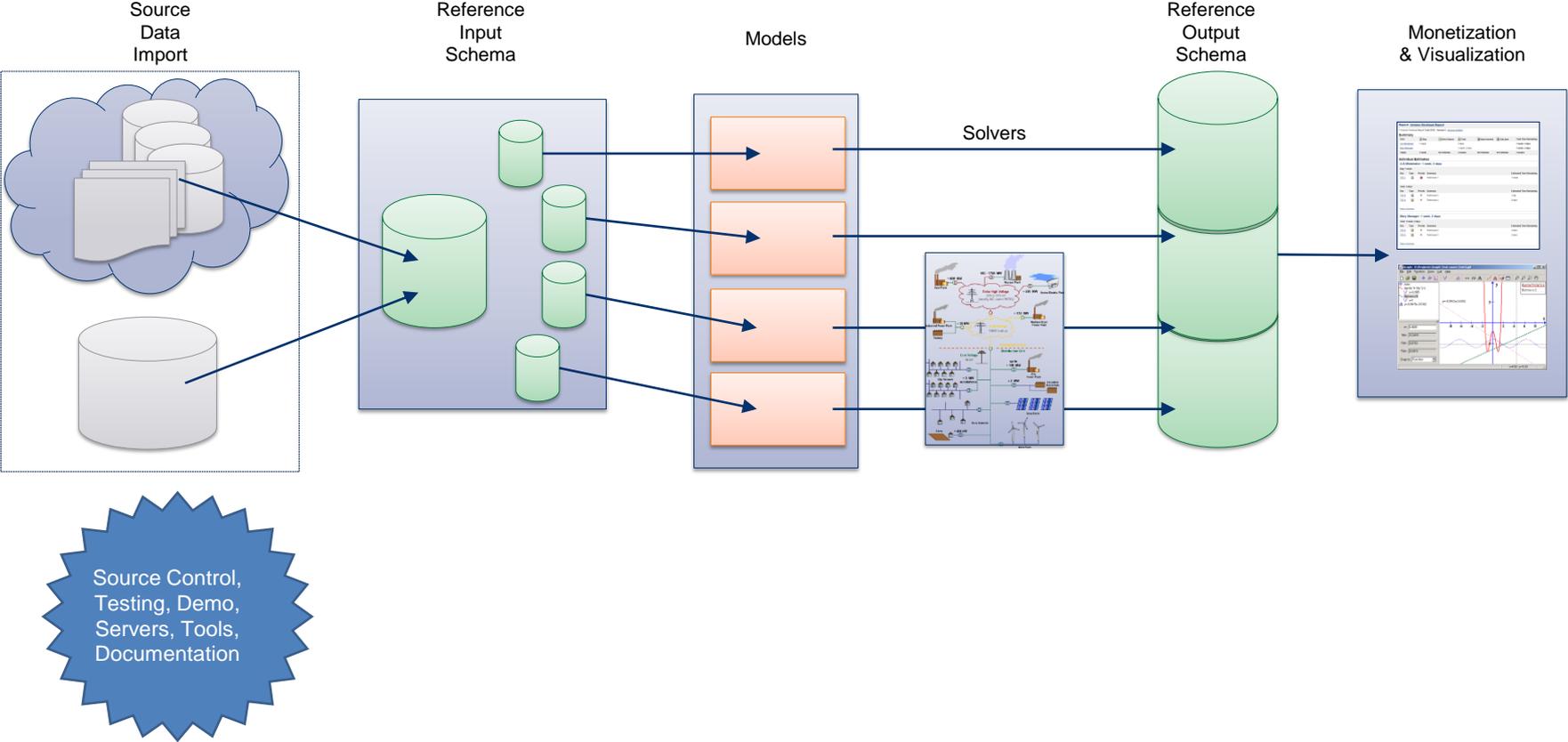
Underlying Principles of Utility Analytics

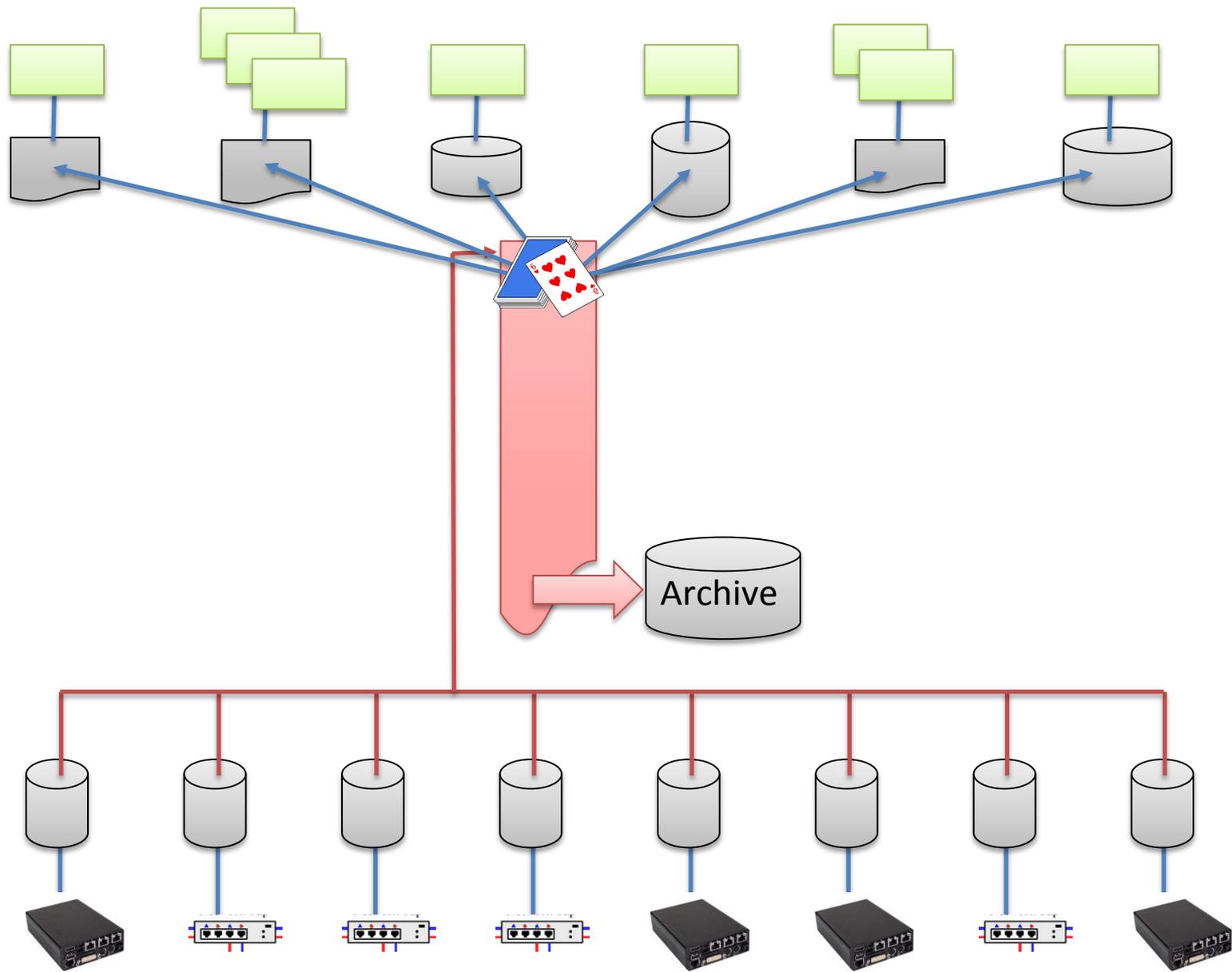
- Start with the decision to be made
- The value of analytics is not measured by how good the models are but by how well utilities model.
- Data management is the most costly part of analyses. The 80/20 rules apply.
- There is only one version of true. Different analyses of the same problem should use the same view of reality. One version of reality does not imply zero uncertainty.
- Modeling and analysis should be open. People should not model in the privacy of their own utility.
- Almost all analyses are variants on older runs.

The most important man in modeling



We Need a Framework, Not a Model

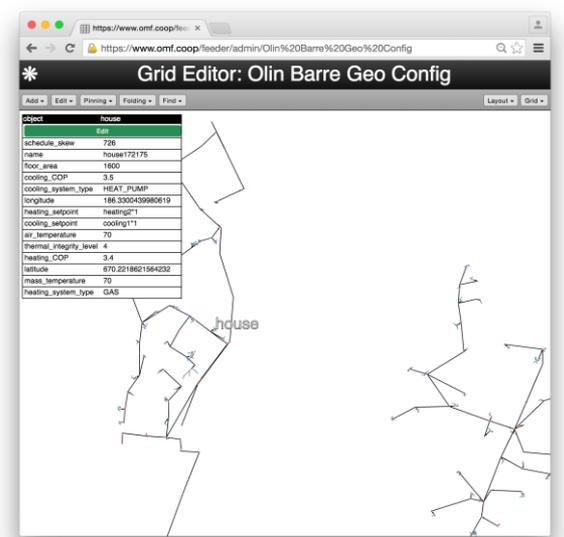
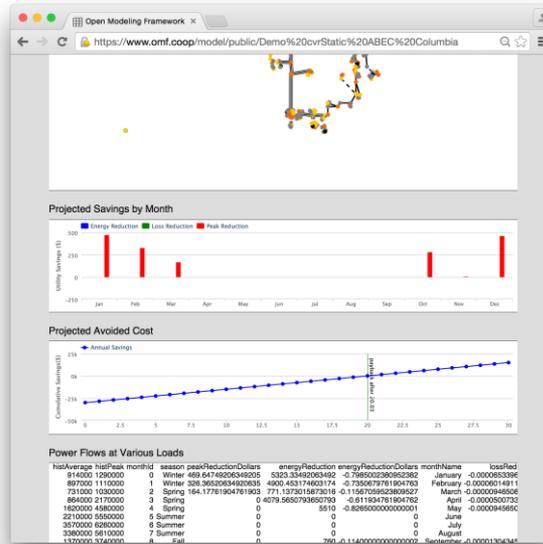
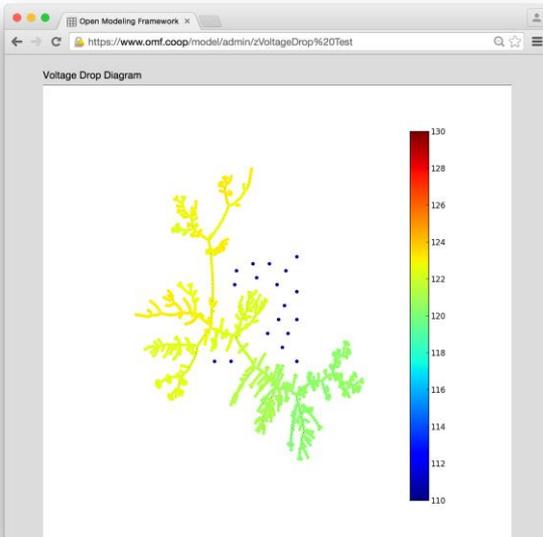
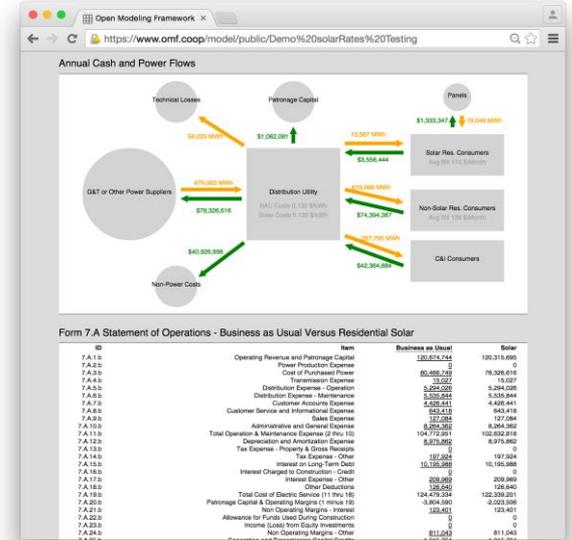
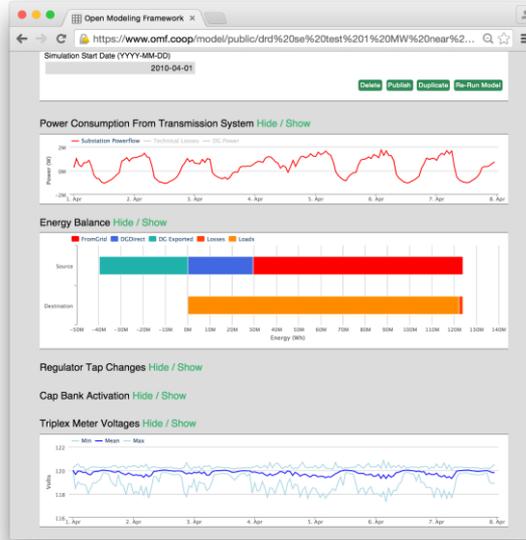
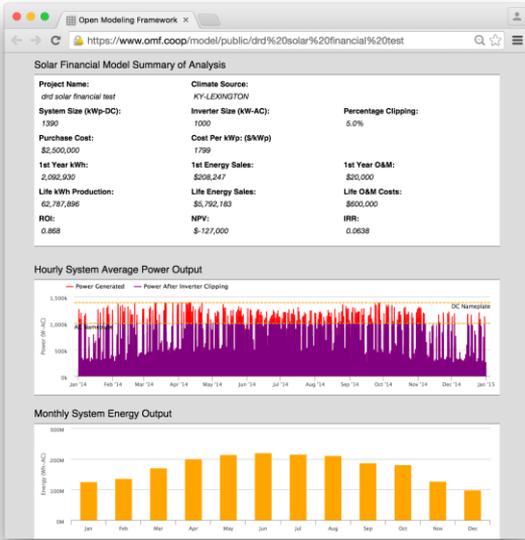




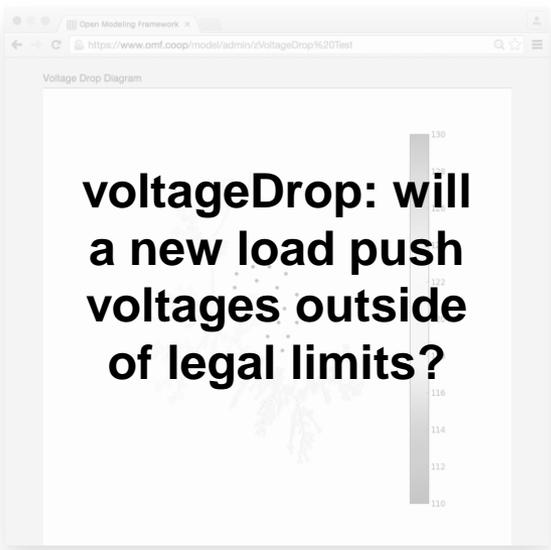
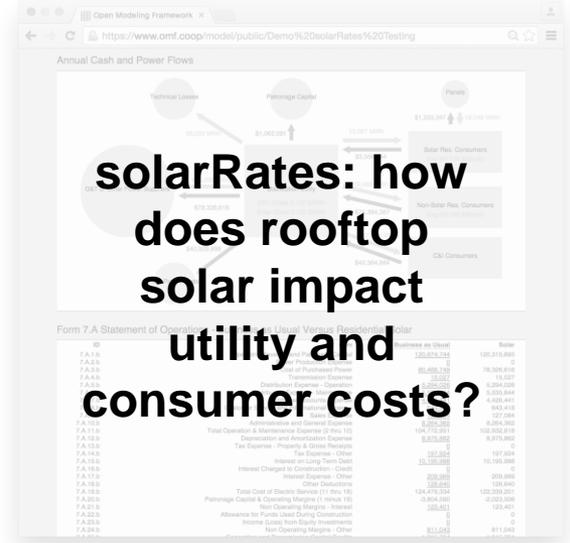
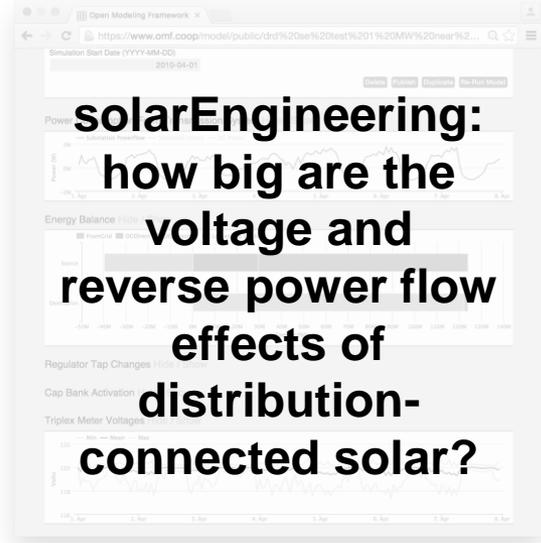
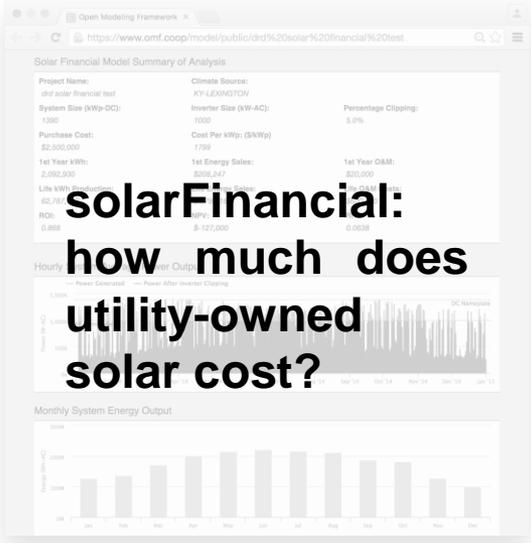
Distribution Analytics Must Be Open Source

The image displays two overlapping browser windows. The background window shows the GitHub repository for 'dpinney / omf'. The repository page includes a search bar, navigation links (Explore, Gist, Blog, Help), and repository statistics: 1,717 commits, 1 branch, 0 releases, and 13 contributors. A file tree on the left lists files such as 'dist', 'omf', '.gitignore', 'Copyright and Trademark.txt', 'License-GPLv2.txt', 'MANIFEST.in', 'cloudDeploy.sh', 'readme.md', 'requirements.txt', and 'setup.py'. The foreground window shows the website 'https://www.omf.coop/'. The website features a large circular network diagram with blue nodes and brown edges. To the right of the diagram is a login form with fields for 'Username' and 'Password', a 'Login' button, a 'Remember Me' checkbox, and a 'Forgot Password?' link. At the bottom of the website, there are links for 'Documentation', 'Discussion', and 'Development'.

Many models are being built in the framework...



... models that utilities are using to answer hard questions.



360 JCL

```
SDSF OUTPUT DISPLAY AGY0157A JOB76303 DSID      3 LINE 0      COLUMNS 02- 81
COMMAND INPUT ==>          SCROLL ==> PAGE
***** TOP OF DATA *****
 1 //AGY0157A JOB A123, 'QUASAR CHUNAWALA', CLASS=A, MSGCLASS=Y,
   // NOTIFY=&SYSUID
   IEFC653I SUBSTITUTION JCL - A123, 'QUASAR CHUNAWALA', CLASS=A, MSGCLASS=Y
 2 //STEP01 EXEC PGM=IEBGENER
 3 //SYSUT1 DD DSN=AGY0157.INPUT.DATA, DISP=SHR
 4 //SYSUT2 DD SYSOUT=*
 5 //SYSIN DD DUMMY
 6 //SYSPRINT DD SYSOUT=*
 7 //STEP02 EXEC PGM=SORT
 8 //SORTIN DD DSN=AGY0157.INPUT.DATA, DISP=SHR
 9 //SORTOUT DD DSN=&&OUTPUT,
   // DISP=(NEW,PASS,DELETE),
   // UNIT=SYSDA,
   // DCB=(RECFM=FB, LRECL=80, BLKSIZE=800),
   // SPACE=(TRK, 1)
10 //SYSIN DD *
11 //SYSOUT DD SYSOUT=*
12 //STEP03 EXEC PGM=IEBGENER
13 //SYSUT1 DD DSN=&&OUTPUT,
   // DISP=(OLD,DELETE)
14 //SYSUT2 DD SYSOUT=*
15 //SYSIN DD DUMMY
16 //SYSPRINT DD SYSOUT=*
***** BOTTOM OF DATA *****
```