Open Source Tools for Energy Data Analysis

Ethan Goldman
VEIC

Vermont Energy Investment Corporation

Vermont Energy Investment Corporation

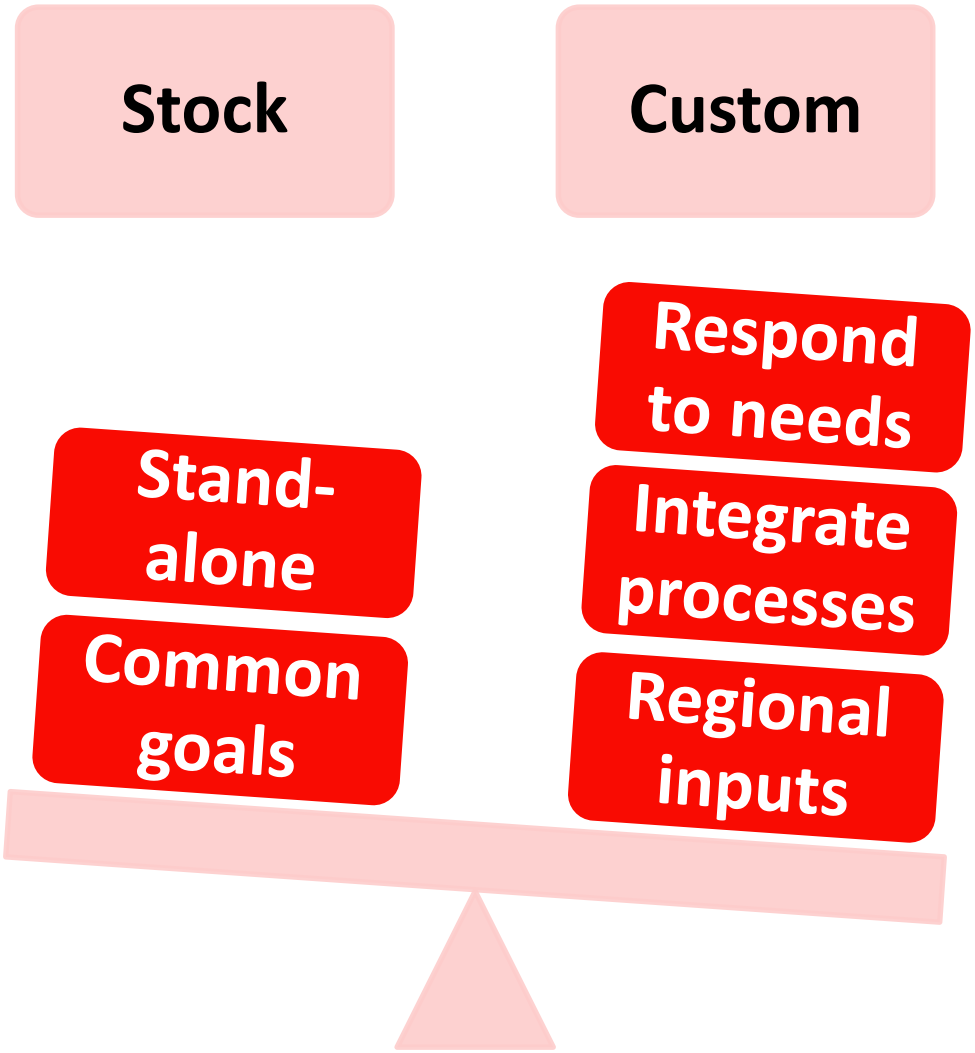
- Mission-driven nonprofit
- Over 25 years reducing economic, environmental costs of energy
- Energy efficiency, renewable energy & transportation
- Consulting & implementation
- 3 energy efficiency utilities

Efficiency Vermont

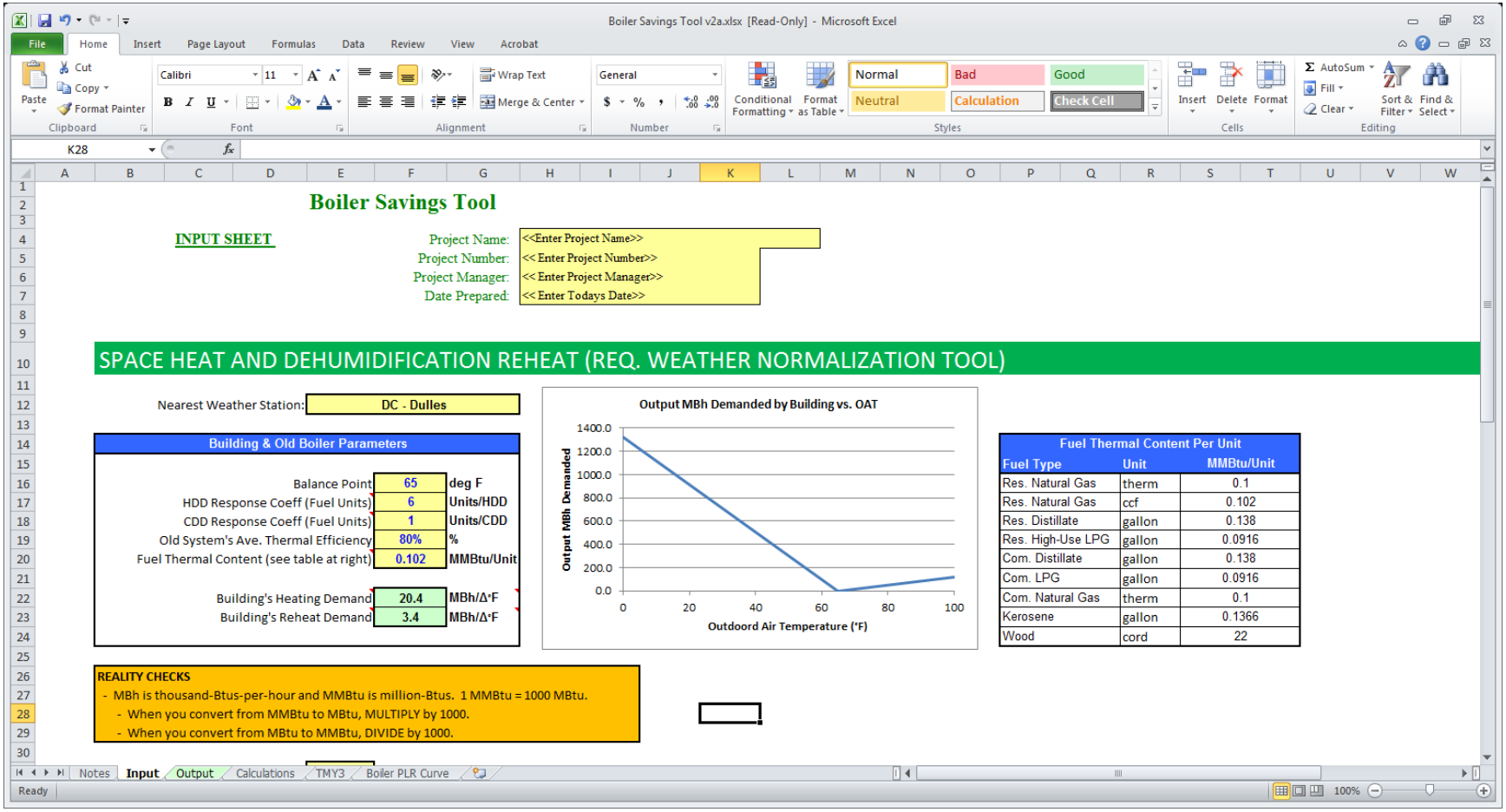
EFFICIENCY$MART

DC SUSTAINABLE ENERGY UTILITY

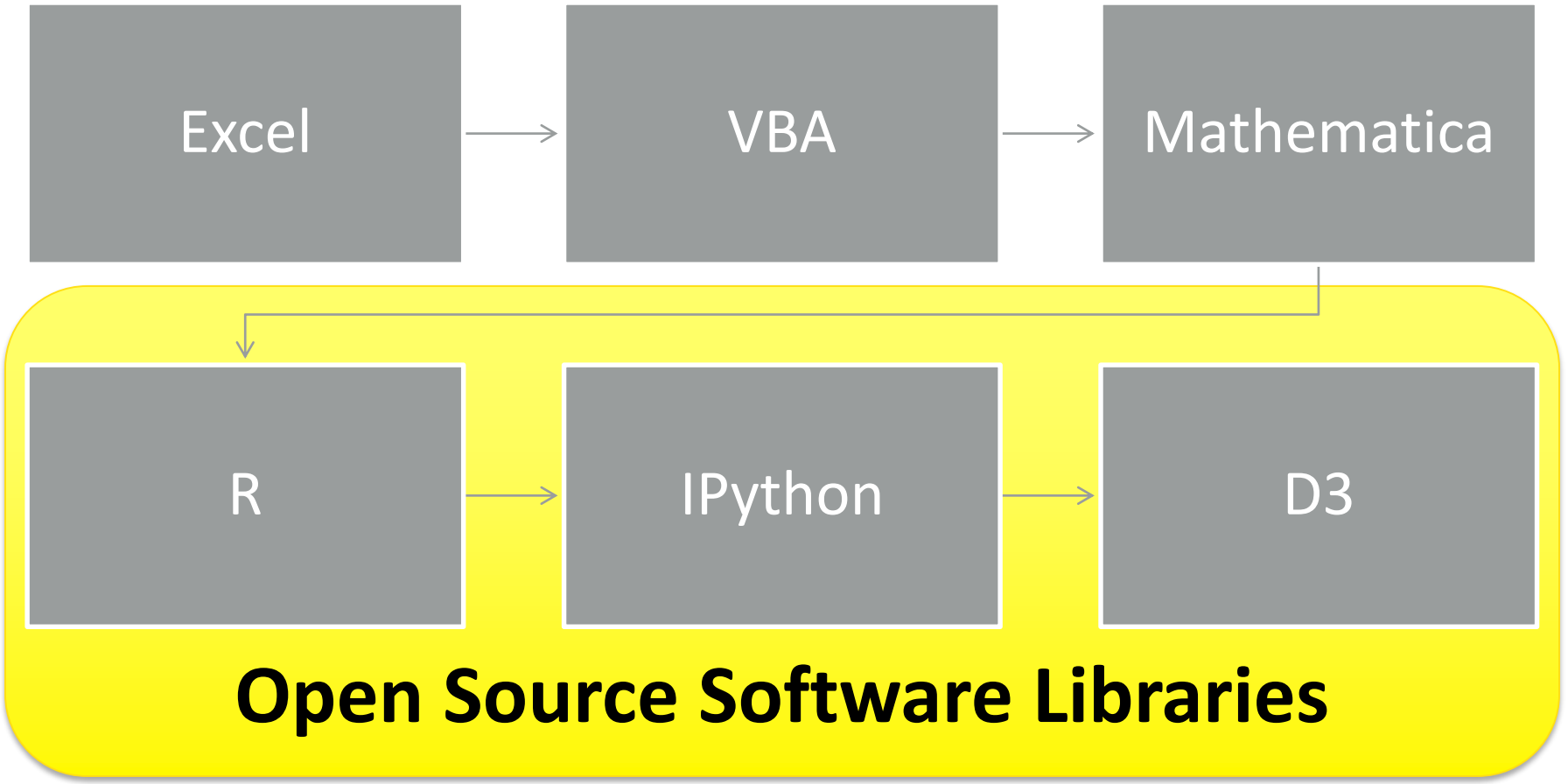
Build or Buy?


Stock
Custom
Respond to needs
Stand-alone
Integrate processes
Common goals
Regional inputs

What Can't Excel Do?



History of VEIC Analysis Tools



IPython Notebooks: Interactive Data Exploration

IP[y]: Notebook Data Warehouse chart export Last Checkpoint: Jul 02 14:42 (unsaved changes)

File Edit View Insert Cell Kernel Help

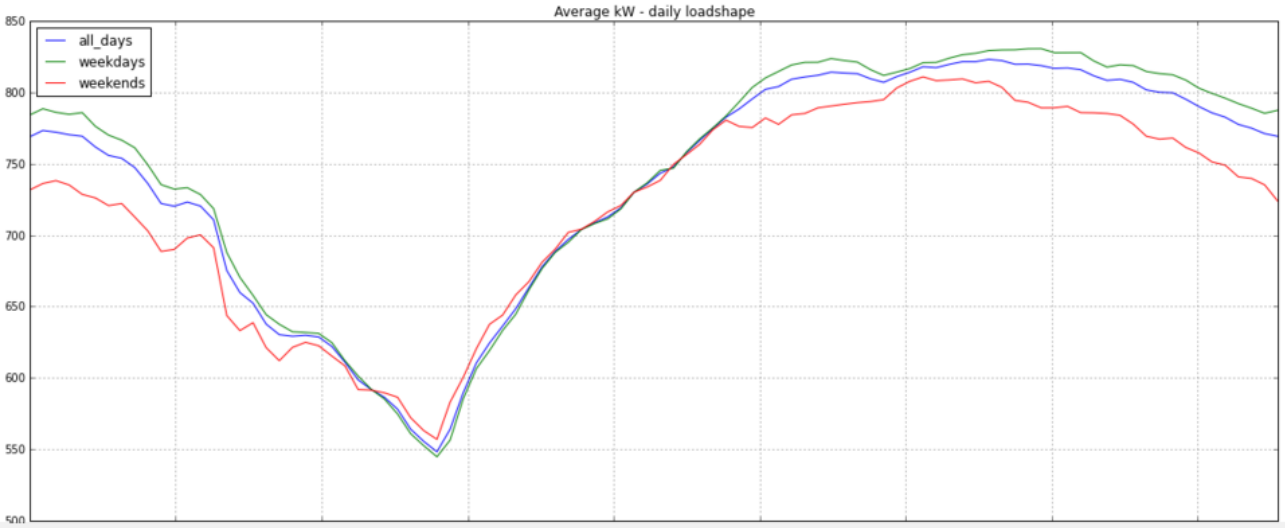
Code Cell Toolbar: None

In [43]:
```
usage_list.head()
```

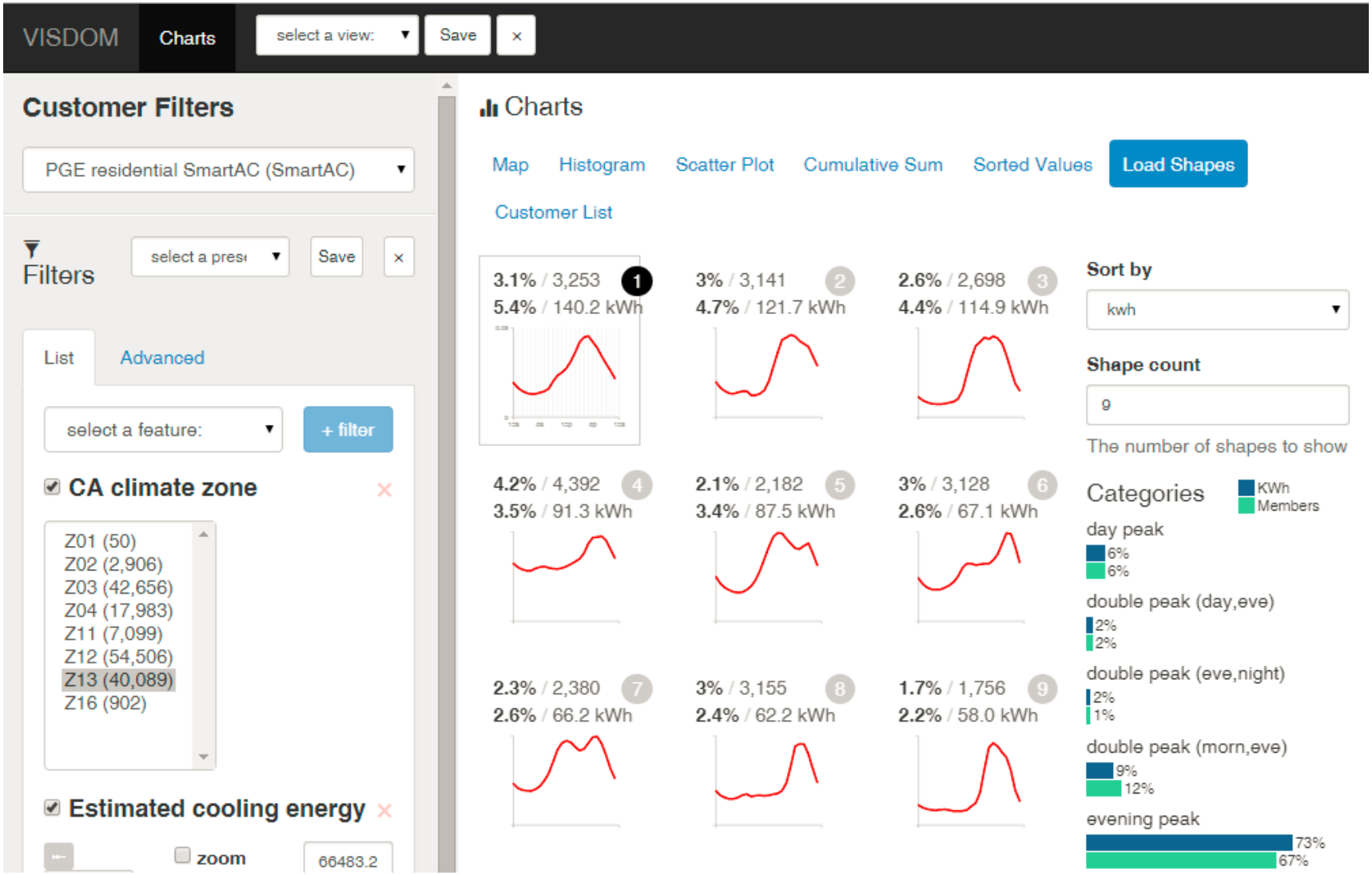
Out[43]:

		kWh	weekday_val	beginning_datetime	avg_kW
date_value					
2015-02-07	**23:45:00**	137.97	5	2015-02-07 23:45:00	551.88
2015-02-08	**00:00:00**	140.85	6	2015-02-08 00:00:00	563.40
	00:15:00	142.56	6	2015-02-08 00:15:00	570.24
	00:30:00	143.01	6	2015-02-08 00:30:00	572.04
	00:45:00	145.44	6	2015-02-08 00:45:00	581.76

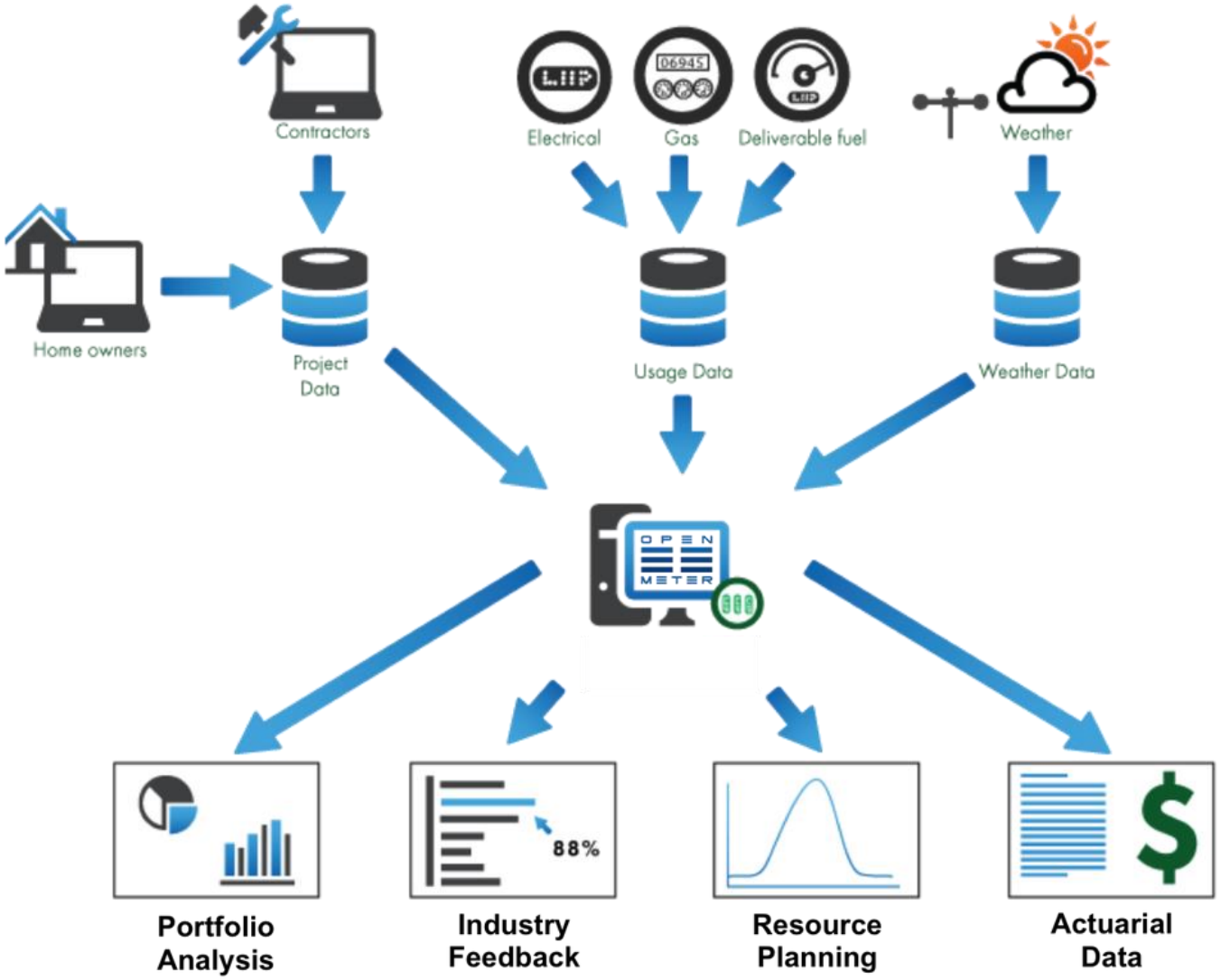
In [38]:
```
loadshapes.plot(figsize=[20,8], title = 'Average kW - daily loadshape')
plt.savefig(output_path + 'kW_loadshape_plot.png')
```



VISDOM: AMI Feature Extraction



Open EE Meter: Standardized Savings Calculations



ENERGY STAR Connected Thermostat Spec: Open Source Algorithm for Reporting

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Questions?

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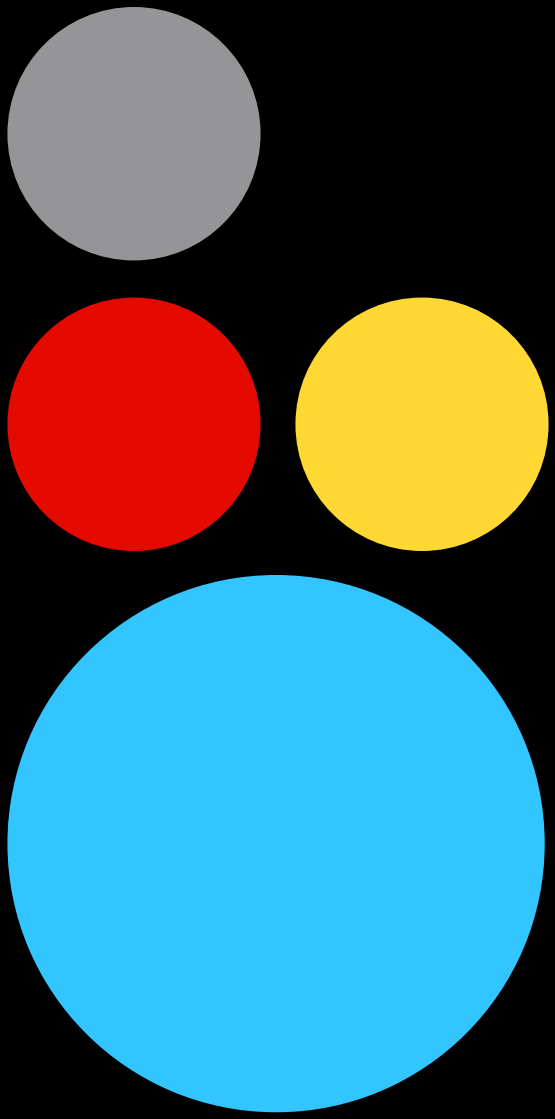

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