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# The Tool Box: Essential Project Development Tools

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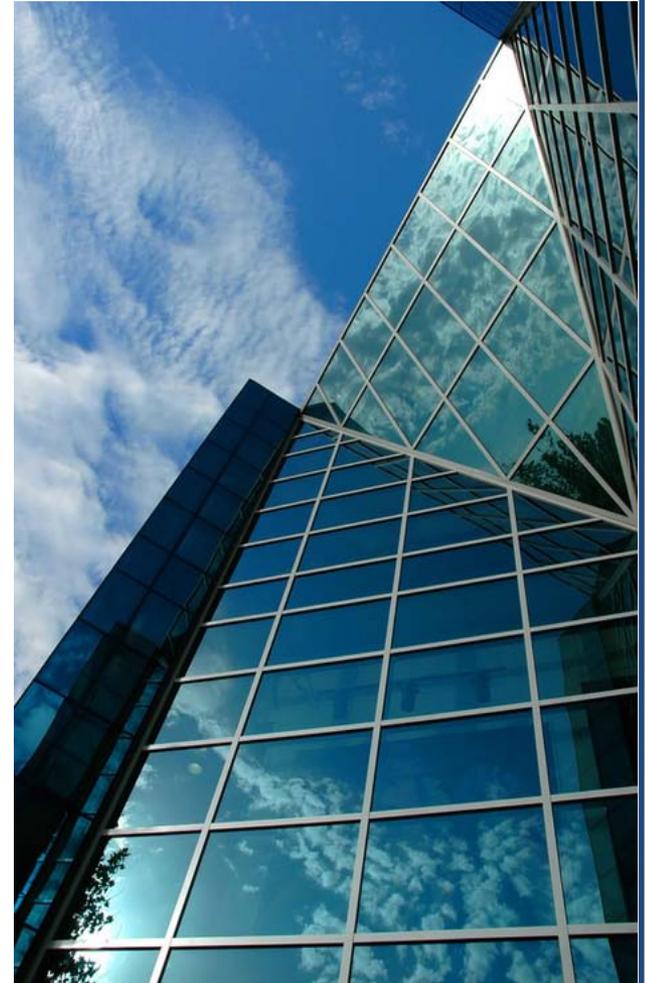
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# Essential Project Development Tools

- Types of Energy Engineering Analysis Tools
  - Weather Data
  - Tools from Government Sources
  - Tools from Non-Government Sources
  - Tools from State Government Sources
  - Building Energy Models
  - Tools from Vendors
  - Benchmarking
  - State and Federal Incentives

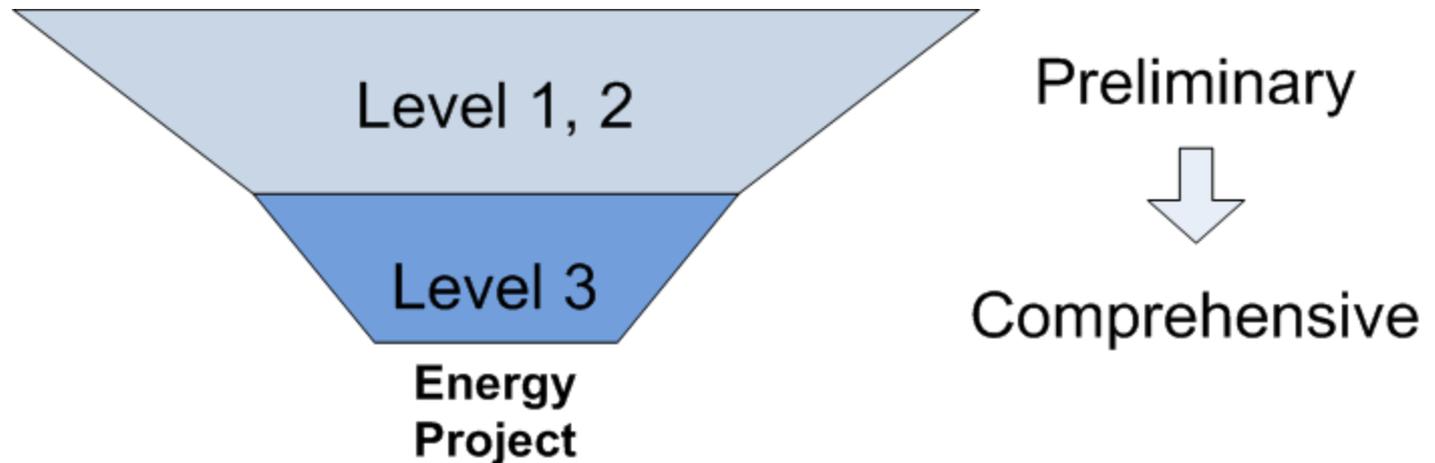
# Agenda

- Brief Overview of Energy Project Development
- Key Types of Energy Engineering Tools & Resources
- How to find state & federal incentives
- Questions / Discussion



# Energy Project Development Overview

- Energy analysis must follow development stage
- Development in multiple steps
  - Preliminary ; ASHRAE Level 1 / Level 2
  - Comprehensive ; ASHRAE Level 3



# Energy Project Development Overview

## Preliminary Development

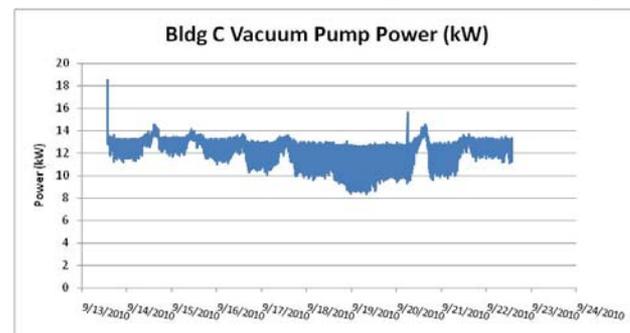
- Collect site and building level annual utility data
- Audit building equipment and systems
- Develop preliminary list of possible energy savings options
- Prepare building energy allocation analysis
- Less accurate definition required for savings and cost. Savings estimates might utilize rules of thumb or past experience with similar types of measures. Similar approaches for project costs
- Goal is selection of an appropriate mix of ECMs to meet site/project energy goals



# Energy Project Development Overview

## Comprehensive Development

- Select specific ECM's for final development
- Collect measurement data and available drawings
- Prepare energy system / savings calculations with boundary conditions set using measurement data, utility energy allocation analysis and experience
- Prepare retrofit scopes of work with up to 25% - 35% engineering
- Finalize ECM pricing
- Final product is definition of financeable energy project



# Key Types of Energy Engineering Tools

- Measurement devices & loggers
- Weather data web sites
- Custom analysis spreadsheets
- Benchmarking Data
- Custom analysis tools developed by utility or government programs
- Vender developed savings estimating tools
- Building energy models



# Key Types of Energy Engineering Tools

## Weather Data

- Daily Data / CDD / HDD Data

- <http://www.wunderground.com/>

- <http://www.degreedays.net/>

- [http://www.nyserda.org/energy\\_information/nyepch.asp](http://www.nyserda.org/energy_information/nyepch.asp) (NY)

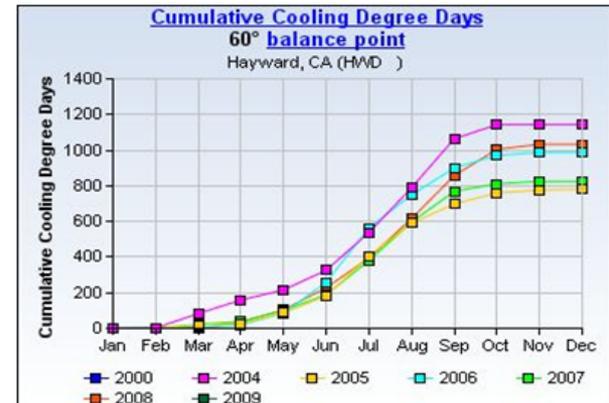
- <http://www.ipm.ucdavis.edu/WEATHER/ddretrieve.html> (CA)

- Many more...

- Hourly Data

- <http://www.weather.gov/om/osd/portal.shtml>

- <http://www.wunderground.com/>



# Key Types of Energy Engineering Tools

## Analysis Tools from Federal Government Sources

- DOE Tools / Resources
  - Tool Resource Library (200+ resources and links)  
([http://www1.eere.energy.gov/femp/information/access\\_tools.html](http://www1.eere.energy.gov/femp/information/access_tools.html))
  - Key applications (DOE-2 applications; SSAT ; PHAST ; AirMaster+ ; MotorMaster ; and many more)

# Key Types of Energy Engineering Tools

## Analysis Tools from Federal Government Sources

- DOE Tools and Resources
  - Financial Applications (BLCC / EERC) (available at link given above)
  - LBNL Labs 21 (<http://labs21.lbl.gov/EPC/intro.htm>)
    - LBNL LEEP (<http://www.labs21century.gov/toolkit/leep.htm>)

# Key Types of Energy Engineering Tools

## Analysis Tools from State Government Sources

- California
  - PG&E Energy Efficiency Resources
  - DEER Efficiency Database (<http://www.energy.ca.gov/deer/>)
  - CEC Programs (<http://www.energy.ca.gov/efficiency/>)
- New York
  - Energy Efficiency Analysis ([http://www.nyserda.org/programs/Energy\\_Analysis/default.asp](http://www.nyserda.org/programs/Energy_Analysis/default.asp))
- Texas <http://www.seco.cpa.state.tx.us/energy-efficiency/>
- Massachusetts <http://www.massenergyrebates.com/Splash.htm>

# Key Types of Energy Engineering Tools

- Analysis Tools from Non-US Government Sources
  - RETScreen4 (<http://www.etscreen.net/ang/home.php>)
  - Prefeasibility / Feasibility / IGA Analysis Support
  - Global weather and solar insulation data
  - Support for many power, EE and renewable techs
    - EE – Chiller retrofit, boiler retrofit, VFDs, ventilation heat recovery, day lighting and efficient lighting
    - Renewable – PV, GSHP, Passive Solar Heating, Solar Thermal Water Heating



# Key Types of Energy Engineering Tools

## Vender Developed Savings Estimating Tools

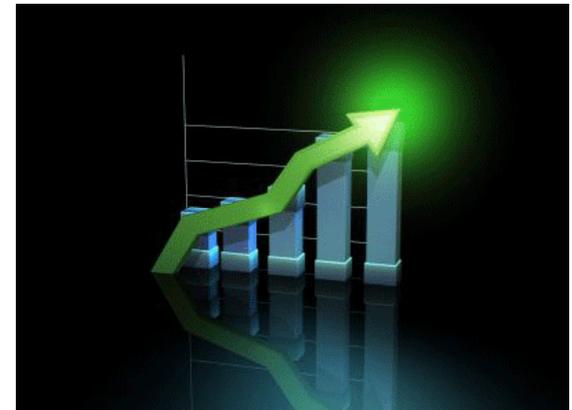
- Aircuity Lab ROI Tool
  - Contact Aircuity at ([gsharp@aircuity.com](mailto:gsharp@aircuity.com))
- Lighting
  - Sylvania (<http://www.sylvania.com/Energy/Calculator/>)
  - Philips (<http://applications.nam.lighting.philips.com/ecocalculator/>)
  - GE ([http://www.geconsumerandindustrial.com/environmentalinfo/tools\\_calculators/](http://www.geconsumerandindustrial.com/environmentalinfo/tools_calculators/))
- VenderMiser
  - ([http://www.usatech.com/energy\\_management/energy\\_calculator.php](http://www.usatech.com/energy_management/energy_calculator.php))
- Window Film
  - Llumar (<http://www.llumar.com/en/OneMinuteChallenge.aspx> )
  - CPFilms, Inc. (<http://www.solutia.com/en/PerformanceFilms.aspx> )



# Key Types of Energy Engineering Tools

## Benchmarking Resources

- General Buildings
  - Energy Star / Portfolio Manager <http://www.energystar.gov/>
  - Energy IQ <http://energyiq.lbl.gov/>
  - CA Study <http://www.energy.ca.gov/ceus/index.html>
  - Federal <http://buildingsdatabook.eere.energy.gov>
- Schools
  - <http://buildingsdatabook.eere.energy.gov>
- Labs
  - LBNL Labs 21 <http://labs21benchmarking.lbl.gov/>



# Key Types of Energy Engineering Tools

## Building Energy Models

- **eQuest** – Free building energy model w/ excellent wizard
  - <http://www.doe2.com/>
- **EnergyPlus**
  - [http://apps1.eere.energy.gov/buildings/energyplus/energyplus\\_about.cfm](http://apps1.eere.energy.gov/buildings/energyplus/energyplus_about.cfm)
- **HAP** – Carrier developed building modeling tool
- **TRACE** – Trane developed load & building analysis tool
- **EnergyPro** – DOE2 Based Simulation Model

# How to Find State & Federal Incentives

- DSIRE Database
  - <http://www.dsireusa.org/>
- State Energy Office Web Sites
  - CA (<http://www.green.ca.gov/EnergyPrograms/rebates.htm>)
  - TX (<http://www.seco.cpa.state.tx.us/energy-efficiency/>)
  - NY (<http://www.nyserda.org/incentives.asp>)
  - CO  
([http://rechargecolorado.com/index.php/energy\\_action\\_planner/find\\_rebates\\_incentives\\_and\\_contractors/](http://rechargecolorado.com/index.php/energy_action_planner/find_rebates_incentives_and_contractors/))



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