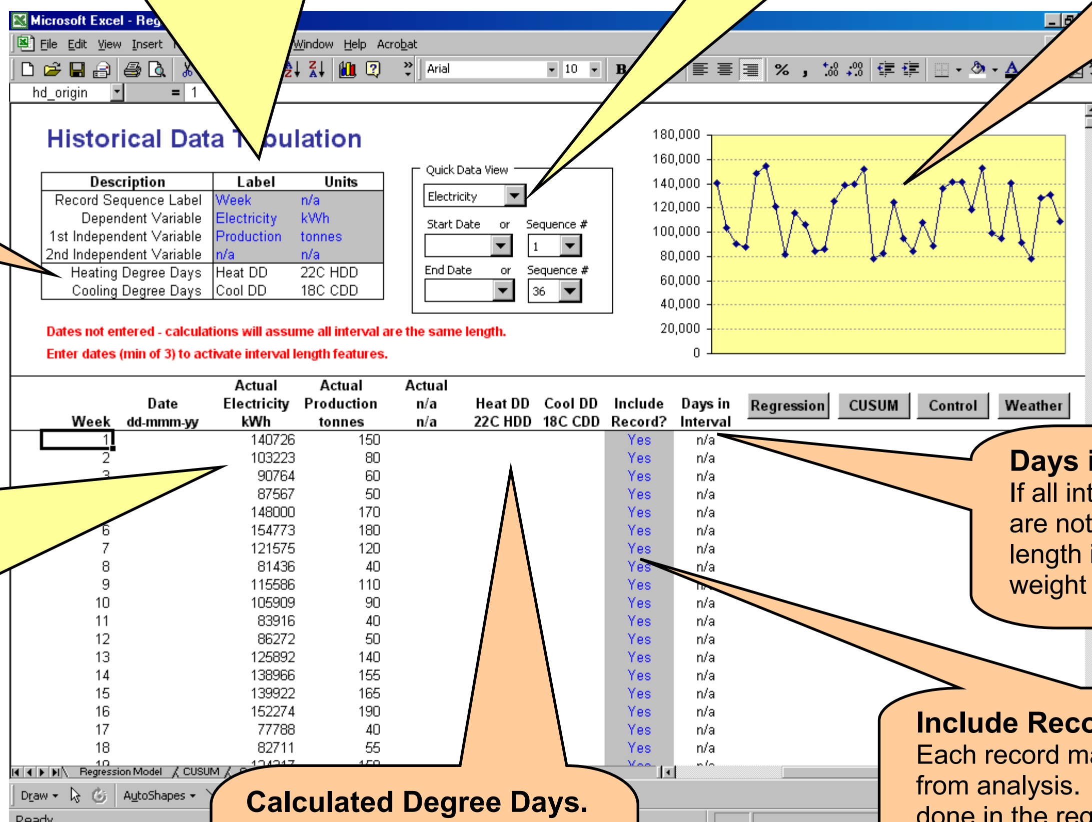
Historical Data Tabulation (Tab = History)

1. Specify Labels and Units for data.
You may specify the labels and units for the period, and the dependent and independent variable. Although degree days (DD) may be calculated for the period using the average temperature data on the weather tab, you may enter DD as in independent variable here. This may useful when you have gas billing data and heating degree days from the gas bills.

3. View your data.
Each variable entered can be viewed on the time sequence graph for any period specified by the date or sequence number.

Time Series Graph
Date is plotted for the specified interval for inspection. This graph can be copied to a new page for further manipulation

Calculated Cooling Degree Days.
Cooling degree days



2. Enter data.
For each period, as identified by the record sequence label, you may enter data for a **date**, **one dependent variable** (electricity in this example), and up to two dependent variables (production in this example).

Days in Interval
If all intervals (weeks in this example) are not the same length, the interval length is calculated and used to weight the regression analysis

Include Record? (Yes or No)
Each record may be excluded from analysis. This is typically done in the regression analysis – initially all values are YES

Calculated Degree Days.
Heating and cooling degree days are calculated for the intervals using the dates entered and the degree days calculated on the weather tab.

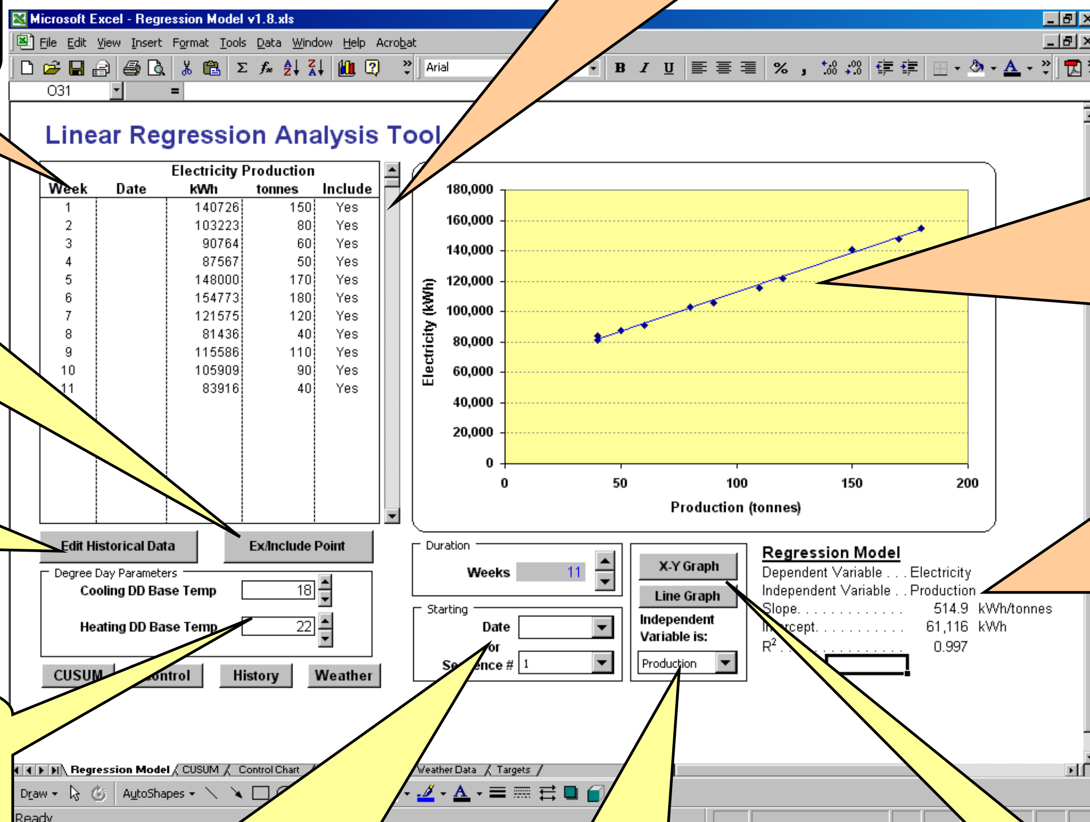
Linear Regression Analysis Tool (Tab = Regression)

Selected Data
The data for the selected period is displayed in a scrolling window

Scroll through selected data

Graphical Analysis
Graph may be configured as an X-Y graph dependent vs. independent, or as a time series of both independent and dependent variables. Graph axis are labeled accordingly and include the term (/day) when a time weighted regression is used.

4. Tune by excluding data points
Place your cursor on the row and use this button to exclude or include points



Regression Model
The regression model is displayed. Slope and intercept are calculated along with the regression coefficient. If the interval lengths are not equal, a time weighted regression will be used and units will include the term per day (/day)

4a. Edit the data for the current row.
Place the cursor on the row and

5. Tune by adjusting degree-day base temperatures
As per weather tab.

1. Select a period for regression analysis.
Begin the regression analysis by selecting a start date and duration – it is often helpful to set the start date and add points one at a time by extending he duration.

2. Select the independent variable
Each of the two variable input and CDD and HDD can be selected.

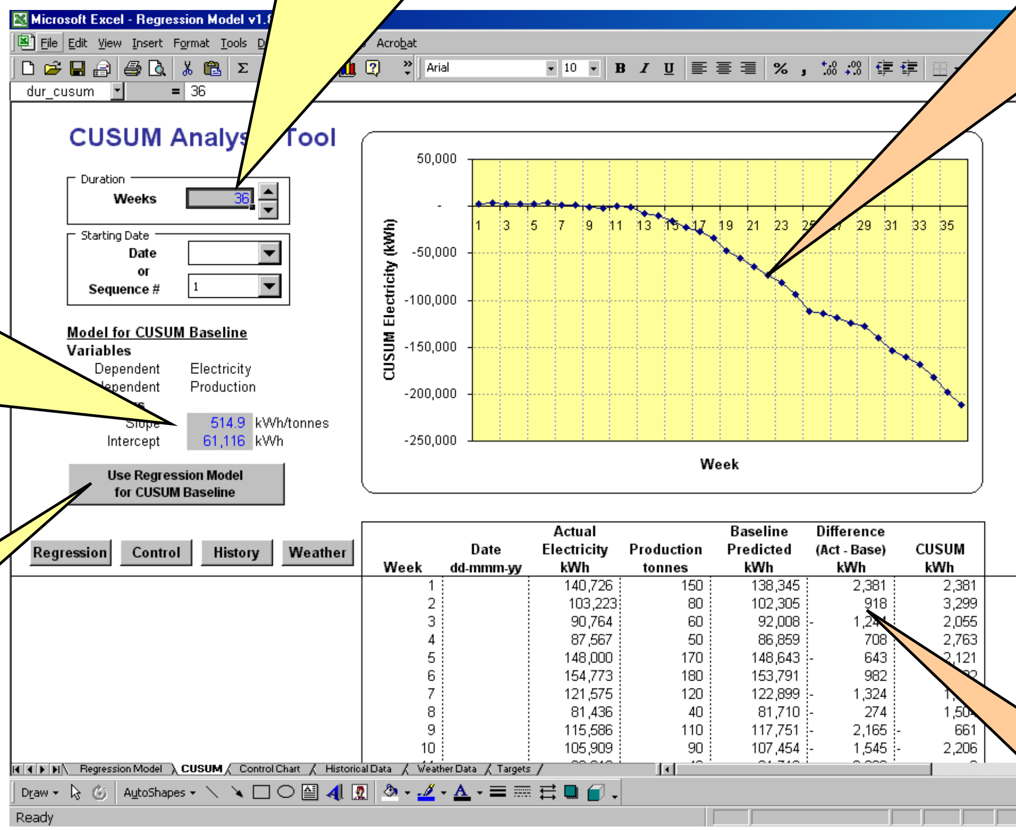
3. Select X-Y or time series graph view

CUSUM Analysis Tool (Tab = CUSUM)

3. Select a period for the control chart.
Specify the start and duration of the control chart – by slowly incrementing the duration you can simulate the progress of consumption

CUSUM Chart
By definition the baseline period will have a slope of zero - in this example the first 11 weeks. Note the changes in slope of the CUSUM. Each change signals a change in the pattern of energy consumption

1. Establish a baseline model for the CUSUM.
Using the regression analysis develop a model for the baseline period. Determine an equation in terms of slope and intercept.



2. Copy the model from the regression analysis.

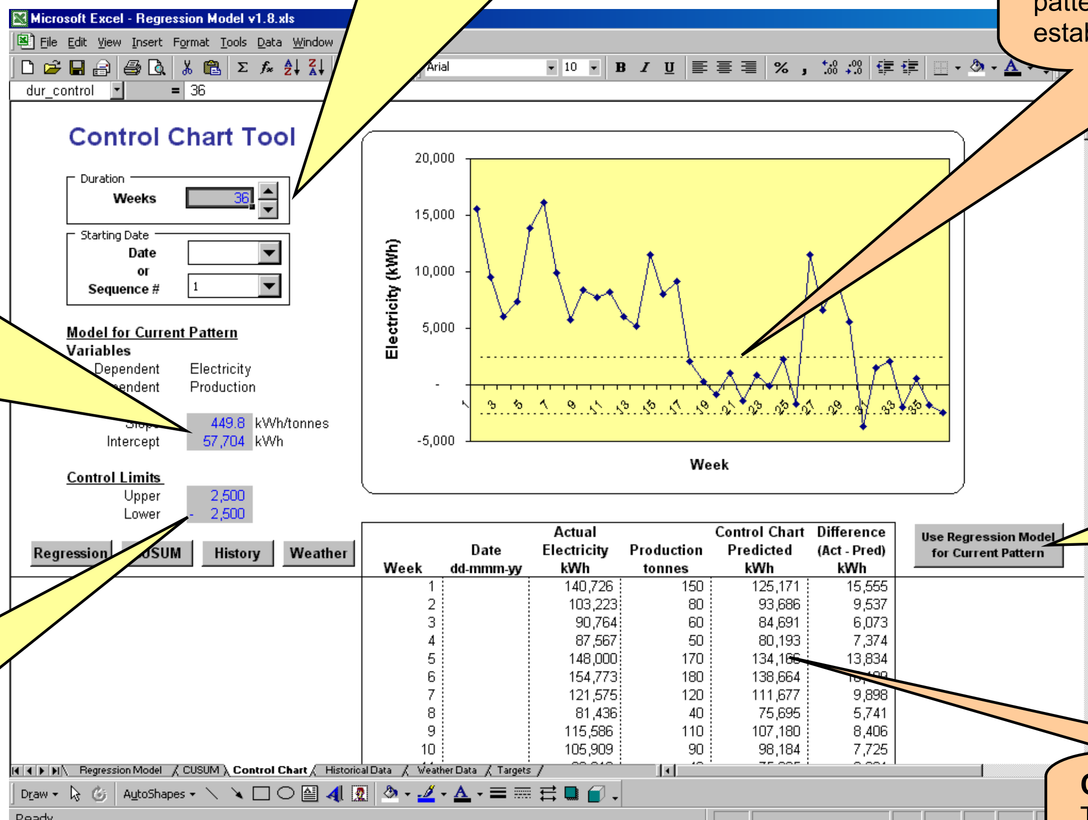
Calculated Data
The data used to construct the CUSUM chart is displayed in this pane and may be view and scrolled.

Control Chart Tool (Tab = Control)

3. Select a period for the control chart.
Specify the start and duration of the control chart – by slowly incrementing the duration you can simulate the progress of consumption

Control limits displayed on the control chart
In this example the current pattern is week 19 to 25 – establishing the control limits.

1. Establish a model for the current pattern.
Using the CUSUM and regression analysis select a period for the current pattern. Use the regression analysis to determine an equation in terms of slope and intercept.



2. Copy the model from the regression analysis.

4. Set the control limits
Using the range the data exhibited during the current pattern set the upper and lower control limits.

Calculated Data
The data used to construct the control chart is displayed in this pane and may be view

Target Analysis (Tab = Target)

2. Develop Target Models
This page provides five methods of determining a target performance model. Each model is represented by an equation of the for **y=mx+b.**

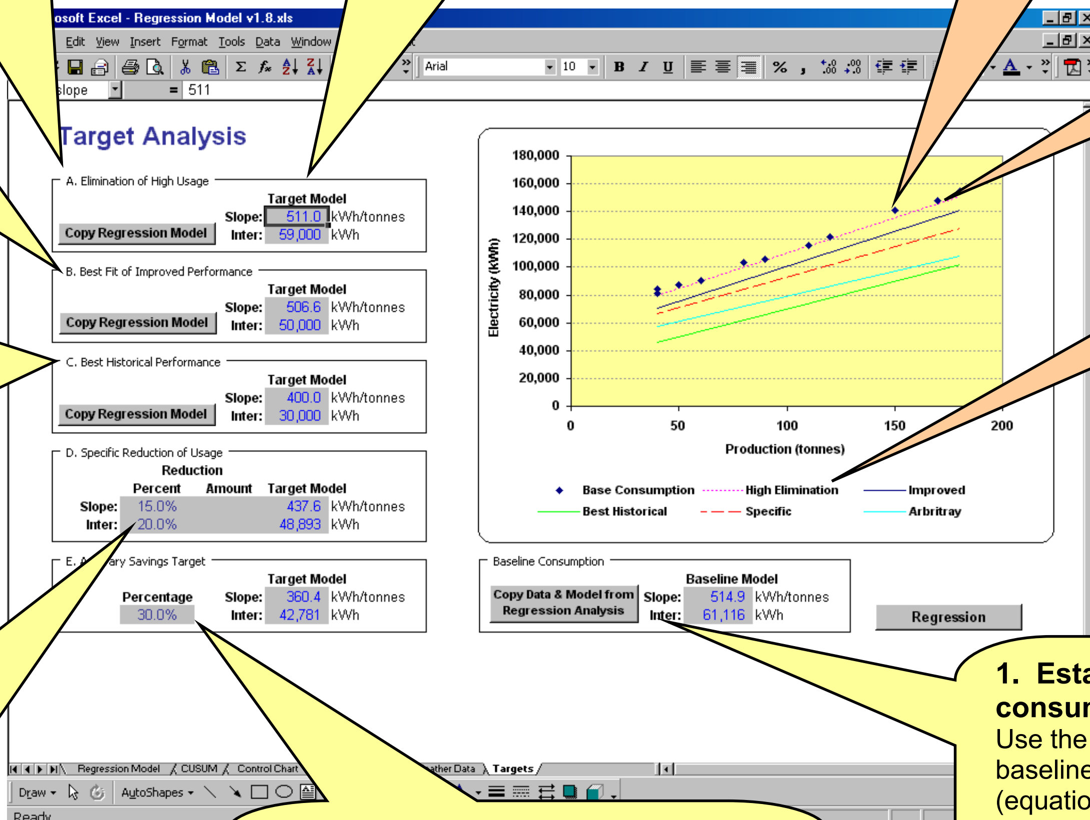
2a. Elimination of High Usage
Using the regression analysis tool exclude points representing high usage to establish a new model – use this as a target.

2b. Best fit of Improved Performance
Use data from a period after energy savings actions are taken to reduce consumption.

2c. Best Historical Performance
Inspect the historical data using the regression analysis &or/CUSUM, to determine the best historical performance.

2d. Specific Reduction
The slope and intercept are reduced by a percentage &/or absolute amounts. The reductions should be linked to specific actions that improve the efficiency (reduce slope) or reduced baseload (reduced intercept).

2e. Arbitrary Percentage Reduction
The slope and intercept of the baseline model are reduced by the percentage specified. This is the least desirable model as it may not by practically attainable.



Baseline data points.
The baseline data points used to derive the model are plotted.

Baseline
The baseline model is plotted as a line on the graph.

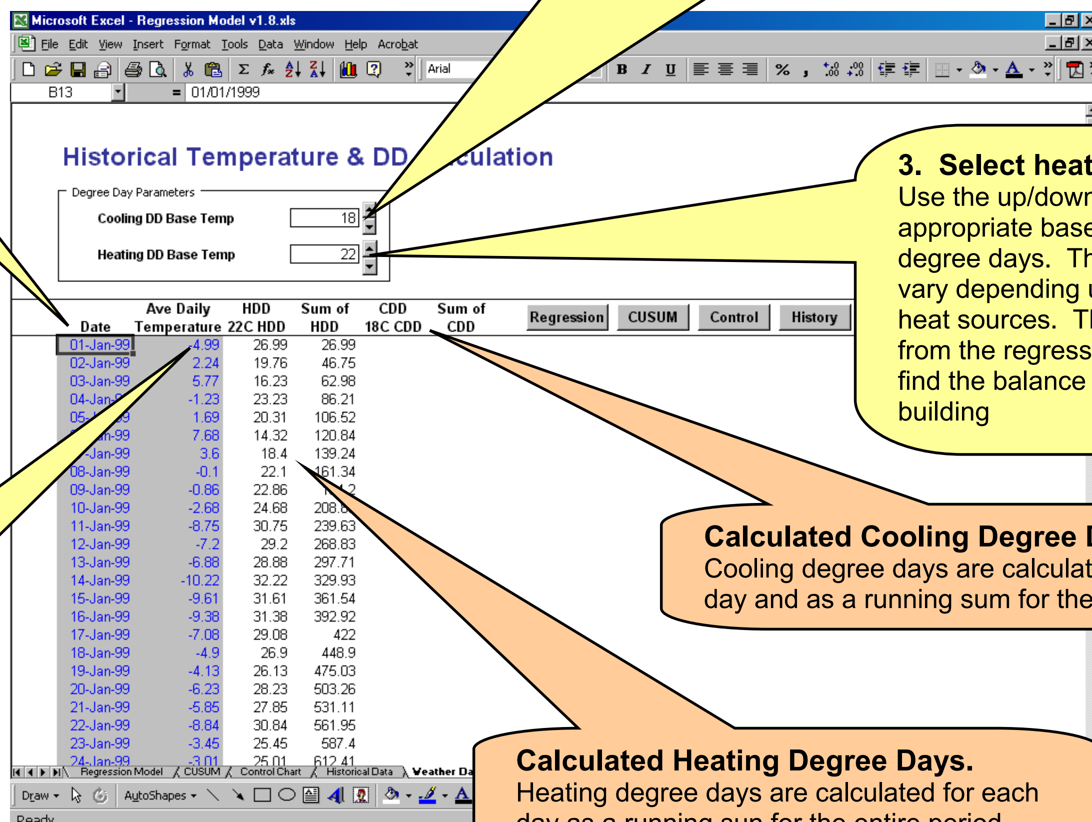
Target models
Each of the five target models are plotted using the equations specified.

1. Establish baseline consumption.
Use the regression analysis to select a baseline period and determine the model (equation) to represent the baseline consumption. Use the Copy button to copy data and model onto this page.

Historical Temperature and DD Calculation (Tab = Weather)

4. Select cooling base temperature.
Use the up/down arrows to select an appropriate base temperature for cooling degree days. This is typically 22C, but may vary depending upon building type and cooling loads. This value may be adjusted from the regression analysis page in order to find the balance point temperature for the cooling systems.

1. Enter dates.
Enter a valid date for each day in the period covered. (max capacity is 2 years = 730 days)



3. Select heating base temperature.
Use the up/down arrows to select an appropriate base temperature for heating degree days. This is typically 18C, but may vary depending upon building type and internal heat sources. This value may be adjusted from the regression analysis page in order to find the balance point temperature for the building

2. Enter average daily temperature.
Enter an average temperature for each day (max capacity is 2 years = 730 days)

Calculated Cooling Degree Days.
Cooling degree days are calculated for each day and as a running sum for the entire period.

Calculated Heating Degree Days.
Heating degree days are calculated for each day as a running sun for the entire period.