

# Using the UCD for Energy Budgeting

## UCD Training

# Using the UCD for Energy Budgeting

## Rationale

- Budgets should be based on typical year consumption values and estimated utility costs
  - Creates a more accurate energy budget
- The UCD has consumption data for every site/aggregate portfolio
- The UCD's weather normalization feature allows users to budget consumption based on the board's "typical consumption"
  - Typical consumption is calculated using the average weather conditions of the past 10 years
  - This allows a "leveling out" of unusually hot or cold years whose consumption may be skewed
- Using the UCD is easy, quick and reliable
- The UCD's data and the accompanying workbook provide all school boards with a consistent, robust methodology
- The sector-wide process has credibility with senior management/trustees
  - Can be applied on an annual basis

# Using the UCD for Energy Budgeting

## What You Need to Do the Job

### 1. From the UCD

- **Board Profile Report (EDU01)**
  - Date Range: FY 2012- FY 2016
  - Normalization: Raw
    - Found on Tab: Energy Profile
      - FY 2016 Electricity Consumption
        - [“A” in the Electricity Workbook]
      - FY 2016 Natural Gas Consumption
        - [“a” in the Natural Gas Workbook]
    - Found on Tab: Overall Profile
      - FY 2016 Total Building Area (including portables and portapaks)
        - This value is used to calculate the “Adjustment for Facility Changes”

# Using the UCD for Energy Budgeting

## What You Need to Do the Job

### 1. From the UCD cont'd

- ***Utility Performance Report (EUP01)***
  - Date Range: Fiscal Year 2016
  - Normalization: n/a
    - Found on Tab: Electricity
      - Typical Year (Electricity) Consumption
        - Total all consumption values in the column
          - [“F” in the Electricity Workbook]
    - Found on Tab: Natural Gas
      - Typical Year (Natural Gas) Consumption
        - Total all consumption values in the column
          - [“f” in the Natural Gas Workbook]

# Using the UCD for Energy Budgeting

## What You Need to Do the Job cont'd

### 2. From Your Board's Energy Advisor

Utility	2016	2017	2018
<b>Electricity</b>	* unit <b>commodity</b> cost (\$/kWh) ["D" in the Workbook]	* projected unit <b>non-commodity</b> cost change (%) ["L" in the Workbook]	* projected unit <b>commodity</b> cost (\$/kWh) ["K" in the Workbook] * projected unit <b>non-commodity</b> cost change (%) ["M" in the Workbook]
<b>Natural Gas</b>	* unit <b>commodity</b> cost (\$/m3 or \$/GJ) ["d" in the Workbook]	* projected unit <b>delivery</b> cost change (%) ["l" in the Workbook]	* projected unit <b>commodity</b> costs (\$/m3 or \$/GJ) ["k" in the Workbook] * projected unit <b>delivery</b> cost change (%) ["m" in the Workbook] * Allowance for <b>carbon costs</b> (\$/m3 or \$/GJ) ["o" in the Workbook]

# Using the UCD for Energy Budgeting

## What You Need to Do the Job cont'd

### 3. Input From Your Board

Utility	FY 2016	FY 2017	FY 2018	FY 2016 to FY 2018
<b>Electricity</b>	electricity spend (\$) ["B" in the Workbook]	electricity budget ["S" in the Workbook]	<b>conservation target</b> from the Board's 5-year <b>Energy Conservation and Demand Management Plan</b> ["H" in the <b>Electricity</b> Workbook]	<b>changes</b> to the Board's <b>Total Building Area</b> (sold/demolished sites; new sites, major additions to new sites etc.) ["G" in the <b>Electricity</b> Workbook]
<b>Natural Gas</b>	natural gas spend (\$) ["b" in the Workbook]	natural gas budget ["t" in the Workbook]	["h" in the <b>Natural Gas</b> Workbook]	["g" in the <b>Natural Gas</b> Workbook]

# Using the UCD for Energy Budgeting

## How to Generate the Board Profile Report in the UCD

1. Select “Board Profile (EDU01)” to obtain FY2016 consumption



General Performance Dashboards Documents Reports Exports

Ontario Ministry of Education

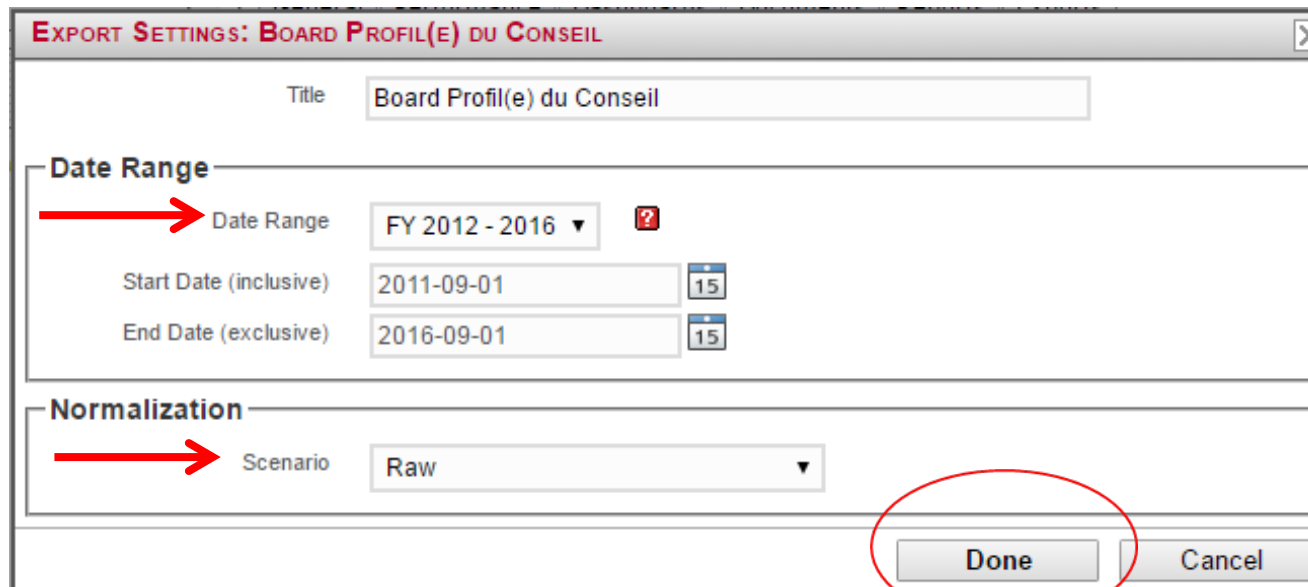
[Peer Inventory - Unventaire des pairs \(EDUP1\)](#) [Energy Intensity Trend / Tendence liées à l'intensité énergétique \(EDU04\)](#)

[Board Profil\(e\) du Conseil \(EDU01\)](#) [Overview of Boards' Energy Use / Aperçu de la consommation d'énergie du conseil \(EDU05\)](#)

[Energy Intensity Comparison / Comparaison de l'intensité énergétique \(EDU02\)](#) [Board Water / Eau du Conseil \(EDU07\)](#)

[Energy Intensity per Student / Intensité énergétique par étudiant \(EDU03\)](#)

2. Select “Date Range” – use FY 2016 for calculating FY 2018 budget, “Normalization” – Raw, click “Done”



EXPORT SETTINGS: BOARD PROFIL(E) DU CONSEIL

Title: Board Profil(e) du Conseil

**Date Range**

Date Range: FY 2012 - 2016

Start Date (inclusive): 2011-09-01

End Date (exclusive): 2016-09-01

**Normalization**

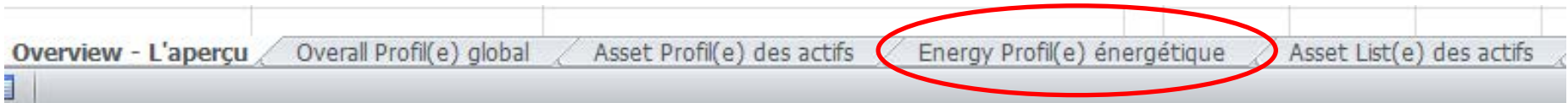
Scenario: Raw

Done Cancel

# Using the UCD for Energy Budgeting

## Board Profile – where to find the required information

1. Select the “Energy Profil(e) énergétique” tab from the bottom of the Excel spreadsheet



2. Identify the following FY 2016 values to be input into the Workbook:

- Electrical Consumption for the board (input in row “A” of the Workbook)
- Natural Gas Consumption for the board (input in row “a” of the Workbook)

Board Profil(e) du Conseil Energy Profil(e) énergétique ABC District School Board	FY2012 / AF2012	FY2013 / AF2013	FY2014 / AF2014	FY2015 / AF2015	FY2016 / AF2016	Year-over-year variance / Variation sur 12 mois (%)	Conservation Goal / Objectif en matière de conservation	Regional Average for FY2016 / Moyenne régionale pour AF2016	Provincial Average for FY2016 / Moyenne provinciale pour AF2016
Electrical Consumption for the board / Consommation d'électricité du conseil (kWh)					A				
Natural Gas Consumption for the board / Consommation de gaz naturel du conseil (ekWh)					a				



# Using the UCD for Energy Budgeting

## How to Generate the Utility Performance Report in the UCD

1. Under the “Export” Tab - select “Utility Performance (EUP01)”

The screenshot shows the UCD interface with the 'Exports' tab selected in the navigation menu. The main content area displays a grid of report categories and their respective report titles. A red arrow points to the 'Utility Performance (EUP01)' report under the 'Utility Usage' category.

Ontario Ministry of Education	
<a href="#">Peer Inventory - Unventaire des pairs (EDUPI)</a>	<a href="#">Energy Intensity Trend / Tendence liées à l'intensité énergétique (EDU04)</a>
<a href="#">Board Profil(e) du Conseil (EDU01)</a>	<a href="#">Overview of Boards' Energy Use / Aperçu de la consommation d'énergie du conseil (EDU05)</a>
<a href="#">Energy Intensity Comparison / Comparaison de l'intensité énergétique (EDU02)</a>	<a href="#">Board Water / Eau du Conseil (EDU07)</a>
<a href="#">Energy Intensity per Student / Intensité énergétique par étudiant (EDU03)</a>	
Energy Usage	
<a href="#">Energy Consumption (EEC01)</a>	<a href="#">Energy Intensity (EEI01)</a>
<a href="#">Energy Consumption Year vs. Year (EEC02)</a>	<a href="#">Energy Performance (EEP01)</a>
<a href="#">Typical Energy Consumption (EEC03)</a>	
Greenhouse Gas	Setup
<a href="#">Emissions (EEM01)</a>	<a href="#">Facility Changes (EFC01)</a>
<a href="#">Emissions Performance (EEM02)</a>	
<a href="#">Emissions Intensity (EEM03)</a>	
Property Management	
<a href="#">Facility Details (EFD01)</a>	
Utility Usage	
<a href="#">Detailed Meter Reading Coverage (EMC01)</a>	<a href="#">Utility Consumption Year vs. Year (EUC02)</a>
<a href="#">Meter Readings (EMR01)</a>	<a href="#">Typical Utility Consumption (EUC03)</a>
<a href="#">Utility Consumption (EUC01)</a>	<a href="#">Utility Performance (EUP01)</a>
UCD Custom	Ontario Green Energy Act
<a href="#">Monthly Energy Intensity (EME01)</a>	<a href="#">Ontario GEA O.Reg.397 11-Energy Consumption and GHG Emissions (GEA01)</a>
<a href="#">Intensity By Facility Variable (EME03)</a>	

# Using the UCD for Energy Budgeting

## How to Generate the Utility Performance Report in the UCD cont'd

2. Select "Date Range" - use FY 2016 and click "Done"

The screenshot shows a dialog box titled "EXPORT SETTINGS: UTILITY PERFORMANCE". The "Title" field contains "Utility Performance". The "Date Range" section is active, with a dropdown menu open. The dropdown menu lists the following options: "Custom Date Range", "Fiscal 2014", "Fiscal 2015", "Fiscal 2016", "Last 2 Full Fiscal Years", "Last 5 Full Fiscal Years", "Calendar 2013", "Calendar 2014", "Calendar 2015", "Last 2 Full Calendar Years", and "Last 5 Full Calendar Years". A red arrow points to "Fiscal 2016". The "Done" button is circled in red.

### Notes:

- FY 2016 is used to calculate the FY 2018 budget
  - Rationale: it is the last full year of data where both the consumption and the Heating Degree Days (HDD) and Cooling Degree Days (CDD) are known

# Using the UCD for Energy Budgeting

## Utility Performance – where to find the required information

1. Use the tabs at the bottom of the Excel spreadsheet
  - Both the Electricity and the Natural Gas tabs will be used



# Using the UCD for Energy Budgeting

## Utility Performance – where to find the required information

### Electricity

- Go to “Typical Year” Column
- Total the values in the column
- This number will be inserted into “F” in Workbook

Calendar Year	Calendar Month	Quarter	Fiscal Year	Fiscal Month	Fiscal Quarter	Unit	Adjusted Baseline	Baseline Adjustments	Opportunity Impacts	Target	Actual	Typical Year	Goal	Unweighted Data Completeness
2015	9	3	2016	1	1	kWh								
2015	10	4	2016	2	1	kWh								
2015	11	4	2016	3	1	kWh								
2015	12	4	2016	4	2	kWh								
2016	1	1	2016	5	2	kWh								
2016	2	1	2016	6	2	kWh								
2016	3	1	2016	7	3	kWh								
2016	4	2	2016	8	3	kWh								
2016	5	2	2016	9	3	kWh								
2016	6	2	2016	10	4	kWh								
2016	7	3	2016	11	4	kWh								
2016	8	3	2016	12	4	kWh								
											Total	F		

- Typical year weather definition
  - the average of the most recent 10 years of degree days
  - used to normalize the FY2016 consumption values to a typical weather year

# Using the UCD for Energy Budgeting

## Utility Performance – where to find the required information

### Natural Gas

- go to “Typical Year” Column
- total the values in the column
- this number will be inserted into “f” in Workbook

Calendar Year	Calendar Month	Quarter	Fiscal Year	Fiscal Month	Fiscal Quarter	Unit	Adjusted Baseline	Baseline Adjustments	Opportunity Impacts	Target	Actual	Typical Year	Goal	Unweighted Data Completeness
2015	9	3	2016	1	1	m <sup>3</sup>								
2015	10	4	2016	2	1	m <sup>3</sup>								
2015	11	4	2016	3	1	m <sup>3</sup>								
2015	12	4	2016	4	2	m <sup>3</sup>								
2016	1	1	2016	5	2	m <sup>3</sup>								
2016	2	1	2016	6	2	m <sup>3</sup>								
2016	3	1	2016	7	3	m <sup>3</sup>								
2016	4	2	2016	8	3	m <sup>3</sup>								
2016	5	2	2016	9	3	m <sup>3</sup>								
2016	6	2	2016	10	4	m <sup>3</sup>								
2016	7	3	2016	11	4	m <sup>3</sup>								
2016	8	3	2016	12	4	m <sup>3</sup>								
											Total	f		

### Notes

- it is important that the “**Unit of Consumption**” in the **Workbook** version that you use **matches** the unit of consumption that appears in the natural gas report – either m<sup>3</sup> or GJ
  - The sample above uses m<sup>3</sup>

# Using the UCD for Energy Budgeting

## Board's Energy Advisor

### Background

- Each board should have an energy advisor

### Energy Advisor Input

- Will provide you with the values for each of items required in the Workbook (see chart on slide 5)
- After each item on the chart, there is a bracket that indicates a letter
  - The letter should be matched to the corresponding letter in the workbook (D, L, K, M)
  - The letters for the Electricity Workbook are all “CAPITALIZED”
    - example ["D" in the Workbook]
  - The letters for the Natural Gas Workbook are all “lower case”
    - example ["d" in the Workbook]

# Using the UCD for Energy Budgeting

## Input From Your Board

### Electricity Spend (“B” in the Workbook)

- Source: your board’s accounting department – ***Financial Year End 2016***
- Includes the total amount spent for electricity, including a portion of the HST

### Natural Gas Spend (“b” in the Workbook)

- Source: your board’s accounting department– ***Financial Year End 2016***
- Includes the total amount spent for natural gas, including a portion of the HST

# Using the UCD for Energy Budgeting

## Input From Your Board cont'd

### Conservation Target

(“H” in the electricity; “h” in the natural gas Workbook)

- If you used the Ministry of Education’s templates for the Green Energy Act’s 5-year Energy Conservation and Demand Management Plan
  - Conservation Goal for 2017-18
  - Ensure you use the correct unit of measurement (ekWh/m<sup>2</sup>) or (ekWh/ft<sup>2</sup>)
    - Note: the energy conservation values are automatically calculated based on \$ value invested per energy management strategy in Appendices B, C, and D
- Alternatively, you can estimate what the savings will be (percentage) based on projects that have been completed since 2016

	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)
Appendix B; Design, Construction and Retrofit Strategies Total	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	0
Appendix C; Operations and Maintenance Strategies Total	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	0
Appendix D; Occupant Behaviour Strategies Total	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	0
TOTAL	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	0
Percentage reduction		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Conservation Goal (ekWh/m <sup>2</sup> )		#DIV/0!	↑	#DIV/0!	↑	#DIV/0!	↑	#DIV/0!	↑	#DIV/0!	#DIV/0!
Conservation Goal (ekWh/ft <sup>2</sup> )		#DIV/0!	↑	#DIV/0!	↑	#DIV/0!	↑	#DIV/0!	↑	#DIV/0!	#DIV/0!



# Using the UCD for Energy Budgeting

## Input From Your Board cont'd

### Conservation Target

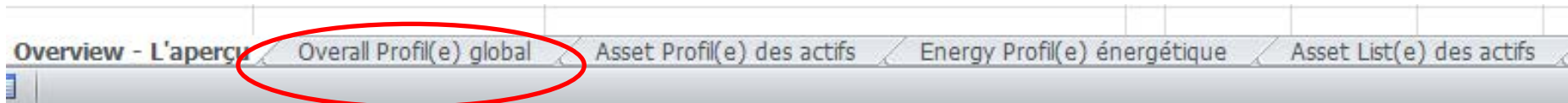
- If you didn't use the template, refer to your 5-year Energy Conservation and Demand Management Plan
  - All plans were required to have annual energy conservation goals for each fiscal year
- Electricity vs Natural Gas Conservation Targets
  - Discretion of the board on how targets are expressed
    - Option # 1**
      - use one target for both utilities
    - Option # 2**
      - define individual targets for each utility

# Using the UCD for Energy Budgeting

## Input From Your Board cont'd

### How to Calculate Adjustment to Facility Changes

- Use the UCD's Board Profile to determine FY 2016 **Total Building Area (includes portables and portapaks)**
  - (see instructions on slide 6 on how to generate)
  - Select "**Overall Profil(e) global**" tab from the bottom of the Excel spreadsheet



# Using the UCD for Energy Budgeting

## Input From Your Board cont'd

## How to Calculate Adjustment to Facility Changes cont'd

## Electricity only

Board Profil(e) du Conseil Overall Profil(e) global Waterloo Catholic District School Board	FY2012 / AF2012	FY2013 / AF2013	FY2014 / AF2014	FY2015 / AF2015	FY2016 / AF2016	Year-over-year variance / Variation sur 12 mois (%)
Total Building Area (includes portables and portapaks) / Superficie totale du bâtiment (comprend les salles de classe préfabriquées et ajout modulaire) (ft <sup>2</sup> )						
Number of Buildings / Nombre de bâtiments						
Number of Buildings with Electricity / Nombre de bâtiments avec électricité						
Number of Buildings with Natural Gas / Nombre de bâtiments avec gaz naturel						
Total Number of Portables / Nombre total de salles de classes préfabriquées						
Total Portable Area / Superficie totale des salles de classe préfabriquées (ft <sup>2</sup> )						
Percentage of Building Area with AC / Pourcentage de la superficie climatisée du bâtiment (0 - 100)						
Average Daily Enrolment / Effectif quotidien moyen						

## Notes

- the Total Building Area value for FY 2016 is used as the foundation to **calculate** the “Adjustment for facility changes” in the Worksheet
  - this number is used in the Worksheet

# Using the UCD for Energy Budgeting

## How to Calculate Adjustment to Facility Changes cont'd Electricity and Natural Gas Step 1

Calculating Changes to Floor Area between FY 2016 and FY 2018			
Fiscal Year	Building Area	Unit (ft2 or m2)	Source
FY 2017	Sold/demolished removed from portfolio	these are a negative value	Board: Facilities Management
	Portables/portapaks removed from portfolio		
	Newly constructed/opened added to portfolio	these are a positive value	
	Portables/portapaks added to portfolio		
FY 2018	Sold/demolished removed from portfolio	these are a negative value	
	Portables/portapaks removed from portfolio		
	Newly constructed/opened added to portfolio	these are a positive value	
	Portables/portapaks added to portfolio		
FY 2018	<b>FY 2018 Estimated change in Total Building Area (includes portables and portapaks)</b>	sum of the above values (ft2 or m2)	Note: this number may be positive <u>or</u> negative
FY 2016	<b>Total Building Area (includes portables and portapaks)</b>	value in ft2 or m2	UCD: Board Profile, Tab: Overview Profile
FY 2018	<b>Percentage change in Total Building Area</b>	percent	calculation (FY 2018 Estimated change in Total Building Area/FY 2016 Total Building Area)

### Notes

- ensure that the unit of measurement is consistent from one year to the next
  - ft<sup>2</sup> vs m<sup>2</sup>

# Using the UCD for Energy Budgeting

## How to Calculate Adjustment to Facility Changes cont'd

### Step 2A - Electricity only

Calculating Adjustment in Electricity Consumption (kWh) between FY 2016 and FY 2018 (kWh)			
<b>FY 2016</b>	Total Electricity Consumed ("A" in the Workbook - from the Board Profile)		UCD: Board Profile, Tab: Energy Profile
	<b>Adjustment for Facility Changes</b> Number of kWh ["G" in the Workbook]		calculation (FY 2018 Percentage change in Total Building Area * FY 2016 Quantity of Electricity Consumed by Total Building Area)

### Notes

- Adjustment for Facility Changes is expressed in kWh

# Using the UCD for Energy Budgeting

## How to Calculate Adjustment to Facility Changes cont'd

### Step 2B – Natural Gas only

Calculating Adjustment in Natural Gas Consumption (m3 or GJ) between FY 2016 and FY 2018 (m3 or GJ)			
<b>FY 2016</b>	Total Natural Gas Consumed ("a" in the Workbook - from the Board Profile)		UCD: Board Profile, Tab: Energy Profile
	<b>Adjustment for Facility Changes</b> Number of m3 or GJ ["g" in the Workbook]		calculation (FY 2018 Percentage change in Total Building Area * FY 2016 Quantity of Natural Gas Consumed by Total Building Area)

### Notes

- Adjustment for Facility Changes is expressed in m<sup>3</sup> or GJ

# Using the UCD for Energy Budgeting

## Using the Worksheet to Calculate Your Energy Budget

- Identify all the values outlined in each of the above sections:
  - UCD Reports
  - Energy Advisor
  - Board Input
- Input the values into the applicable Worksheet matching the letters to ensure accuracy

### Example

- From the Electricity Worksheet

FY2016 consumption - raw	A		kWh	UCD: Board Profile Report (EDU 01) - Energy Profile tab
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- From the UCD

Board Profil(e) du Conseil Energy Profil(e) énergétique ABC District School Board	FY2012 / AF2012	FY2013 / AF2013	FY2014 / AF2014	FY2015 / AF2015	FY2016 / AF2016
Electrical Consumption for the board / Consommation d'électricité du conseil (kWh)					A

- When all the values are entered, the Workbook will automatically calculate the budget for the specified utility

# Using the UCD for Energy Budgeting

## Using the Worksheet to Calculate Your Energy Budget cont'd

- The Worksheet can be found at [bit.do/energybudget](http://bit.do/energybudget)
  - It has been colour coded to assist users

	Electricity
	Natural Gas
	Source: UCD
	Source: Energy Advisor
	Source: Board Input
	Source: Calculation from Adjustment for Facility Changes

- A sample Workbook has been completed to demonstrate how it all comes together



# Using the UCD for Energy Budgeting

## Using the Worksheet to Calculate Your Energy Budget cont'd

1. Complete the Electricity Worksheet
2. Complete the Natural Gas Work Sheet
3. If a board has Fuel Oil or Propane
  - the Natural Gas Worksheet can also be used to calculate a budget for those utilities provided you have estimated unit cost for FY 2018
4. If a board has wood, district heat or district cool
  - the Natural Gas Worksheet can also be used to calculate a budget for those utilities provided you have estimated unit cost for FY 2018
5. To finalize your board's energy budget, add the FY 2018 estimated budget for each utility

# Using the UCD for Energy Budgeting

## Sample Workbook

### Sample Values from the UCD

SAMPLE - Values Entered into Workbook for Demonstration Purposes				
From the UCD				
Year	Section on the Workbook	Corresponding Letter on the Workbook	Sample Value	Unit
FY 2016	Electricity Consumed	A	55,000,000	kWh
	Natural Gas Consumed	a	4,500,000	m3
	Total Building Area (including portables/portapaks)	used in calculation for <b>Adjustment for Facility Changes</b>	7,500,000	ft2
	Typical Year Consumption - Electricity	F	59,000,000	kWh
	Typical Year Consumption - Natural Gas	f	5,000,000	m3

	Electricity
	Natural Gas
	Source: UCD
	Source: Energy Advisor
	Source: Board Input
	Source: Calculation from Adjustment for Facility Changes

# Using the UCD for Energy Budgeting

## Sample Workbook

### Sample Values From the Energy Advisor

SAMPLE - Values Entered into Workbook for Demonstration Purposes				
From the Energy Advisor				
Year	Section on the Workbook	Corresponding Letter on the Workbook	Sample Value	Unit
FY 2016	unit <b>commodity cost</b> electricity (\$/kWh)	D	0.125	\$/kWh
	unit commodity cost natural gas (\$/m3 or \$/GJ)	d	0.12	\$/m3
FY 2017	projected unit <b>non-commodity cost</b> change - electricity (%)	L	1	%
	projected unit <b>delivery cost</b> change - natural gas (%)	l	1	%
FY 2018	projected unit <b>commodity cost</b> - electricity (\$/kWh)	K	0.13	\$/kWh
	projected unit <b>non-commodity cost</b> change - electricity (%)	M	1	%
	projected unit <b>commodity cost</b> - natural gas (\$/m3 or \$/GJ)	k	0.11	\$/m3
	projected unit <b>delivery cost</b> change - natural gas (%)	m	1	%
	allowance for <b>carbon costs</b> (\$/m3 or \$/GJ)	o	0.0332	\$/m3

	Electricity
	Natural Gas
	Source: UCD
	Source: Energy Advisor
	Source: Board Input
	Source: Calculation from Adjustment for Facility Changes

# Using the UCD for Energy Budgeting

## Sample Workbook

### Sample Values – Input From the Board

SAMPLE - Values Entered into Workbook for Demonstration Purposes				
Input from the Board				
Year	Section on the Workbook	Corresponding Letter on the Workbook	Value	Unit
FY 2016	Electricity Spend	B	\$ 3,954,239	\$
	Natural Gas Spend	b	\$ 152,194	\$
FY 2017	Electricity Budget	S	\$ 3,750,000	\$
	Natural Gas Budget	t	\$ 200,000	\$
FY 2018	Conservation Target Source: Board's <b>Green Energy Act 5-year Energy</b>	H/h	-2%	%
FY 2016- FY 2018	Adjustment for Facility Changes - Electricity (see calculation sheet)	G	606,800	kWh
FY 2016- FY 2018	Adjustment for Facility Changes - Natural Gas (see calculation sheet)	g	24,272	m3

	Electricity
	Natural Gas
	Source: UCD
	Source: Energy Advisor
	Source: Board Input
	Source: Calculation from Adjustment for Facility Changes

# Using the UCD for Energy Budgeting

## Sample Workbook – Calculating FY 2018 Electricity Budget

### School Board Electricity Budgeting Worksheet

INPUT	REFERENCE	INPUT	UNIT	SOURCE
FY2016 consumption - raw	A	25,000,000	kWh	UCD: Board Profile Report (EDU 01) - Energy Profile tab
FY2016 Electricity spend	B	\$ 3,954,239	\$	Board input - source: accounting information
FY2016 Average unit cost	C	\$ <b>0.1582</b>	per kWh	Calculated (embedded formula)
FY2016 unit commodity cost	D	\$ 0.1120	per kWh	Board input - source: Energy advisor
FY2016 average unit non-commodity cost	E	\$ 0.0462	per kWh	Calculated (embedded formula)

# Using the UCD for Energy Budgeting

## Sample Workbook – Calculating FY 2018 Electricity Budget cont'd

INPUT	REFERENCE	INPUT	UNIT	SOURCE
Typical year consumption - weather normalized	F	30,000,000	kWh	UCD: Utility Performance Report (EUP01) - Electricity tab
Adjustment for facility changes	G	606,800	kWh	Board estimate - changes in Total Building Area from FY 2016- FY 2018
Adjustment for conservation measures	H	-2%	kWh	Board estimate - conservation target
FY2018 projected consumption	I	<b>29,994,664</b>	kWh	Calculated
Percent increase/decrease from FY2016 consumption	J	<b>20.0%</b>	% kWh	Calculated (embedded formula)

# Using the UCD for Energy Budgeting

## Sample Workbook – Calculating FY 2018 Electricity Budget cont'd

INPUT	REFERENCE	INPUT	UNIT	SOURCE
<b>FY2018 projected unit commodity cost</b>	K	\$ 0.1120	per kWh	Board input - source: Energy advisor
FY2017 projected unit non-commodity cost change	L	2%	% \$	Board input - source: Energy advisor
FY2018 projected unit non-commodity cost change	M	2%	% \$	Board input - source: Energy advisor
<b>FY2018 projected unit non-commodity cost</b>	N	\$ 0.0480	per kWh	Calculated (embedded formula)
<b>FY2018 projected unit total cost</b>	O	\$ 0.1600	per kWh	Calculated (embedded formula)
Percent increase/decrease from FY2016 average unit cost	P	1.2%	% \$	Calculated (embedded formula)

# Using the UCD for Energy Budgeting

## Sample Workbook – Calculating FY 2018 Electricity Budget cont'd

INPUT	REFERENCE	INPUT	UNIT	SOURCE
<b>FY2018 projected Electricity budget</b>	Q	\$ 4,800,000	\$	Calculated (embedded formula) to nearest \$ 000
Percent increase/decrease from FY2016 spend	R	21.4%	% \$	Calculated (embedded formula)
FY2017 budget for electricity	S	\$ 3,750,000	\$	Board accounting information
Percent increase/decrease from FY2017 budget	T	28.0%	% \$	Calculated (embedded formula)



# Using the UCD for Energy Budgeting

## Sample Workbook – Calculating FY 2018 Natural Gas Budget

### School Board Natural Gas Budgeting Worksheet

INPUT	REFERENCE	INPUT	UNIT	SOURCE
FY2016 consumption - raw	a	1,000,000	m <sup>3</sup>	UCD: Board Profile Report (EDU 01) - Energy Profile tab
FY2016 NG spend	b	\$ 152,194	\$	Board accounting information
FY2016 Average unit cost	c	\$ 0.1522	per m <sup>3</sup>	Calculated
FY2016 unit commodity cost	d	\$ 0.1200	per m <sup>3</sup>	Energy advisor
FY2016 average unit delivery cost	e	\$ 0.0322	per m <sup>3</sup>	Calculated

# Using the UCD for Energy Budgeting

## Sample Workbook – Calculating FY 2018 Natural Gas Budget cont'd

INPUT	REFERENCE	INPUT	UNIT	SOURCE
Typical year consumption -weather normalized	f	1,200,000	m <sup>3</sup>	UCD: Utility performance (EUP01) - Natural gas tab, Typical Year column total
Adjustment for facility changes	g	24,272	m <sup>3</sup>	Board estimate
Adjustment for general conservation measures	h	-2%		Board estimate - GEA 5 year conservation plan targets helpful here
FY2018 projected consumption	i	1,200,272	m <sup>3</sup>	Calculated
Percent increase/decrease from FY2016 consumption	j	20.0%	% m3	Calculated

# Using the UCD for Energy Budgeting

## Sample Workbook – Calculating FY 2018 Natural Gas Budget cont'd

INPUT	REFERENCE	INPUT	UNIT	SOURCE
<b>FY2018 projected unit commodity cost</b>	k	\$ 0.1300	per m <sup>3</sup>	Energy advisor
FY2017 projected unit delivery cost change	l	-5%	% \$	Energy advisor
FY2018 projected unit delivery cost change	m	6%	% \$	Energy advisor
<b>FY2018 projected unit delivery cost</b>	n	\$ 0.0324	per m <sup>3</sup>	Calculated
<b>FY2018 Allowance for carbon costs</b>	o	\$ 0.0334	per m <sup>3</sup>	Based on currently approved rates - from energy advisor
<b>FY2018 projected unit total cost</b>	p	\$ 0.1958	per m <sup>3</sup>	Calculated
Percent increase/decrease from FY2016 average	q	29%	% \$	Calculated

# Using the UCD for Energy Budgeting

## Sample Workbook – Calculating FY 2018 Natural Gas Budget cont'd

INPUT	REFERENCE	INPUT	UNIT	SOURCE
<b>FY2018 projected Natural Gas budget</b>	r	\$ 235,000		Calculated to nearest \$ 000
Percent increase/decrease from FY2016 spend	s	54%	% \$	Calculated
FY2017 budget for gas	t	\$ 200,000		Board accounting information
Percent increase/decrease from FY2017 budget	u	17.5%	% \$	Calculated

# Using the UCD for Energy Budgeting

## Sample Workbook – Total Energy Budget

<b>FY2018 projected Electricity budget</b>	Q	<b>\$ 4,800,000</b>
<b>FY2018 projected Natural Gas budget</b>	r	<b>\$ 235,000</b>
FY2018 projected Fuel Oil budget	if applicable	n/a
FY2018 projected Propane budget	if applicable	n/a
FY2018 projected Wood budget	if applicable	n/a
FY2018 projected District Heat budget	if applicable	n/a
FY2018 projected District Cool budget	if applicable	n/a
	<b>Total</b>	<b>\$ 5,035,000</b>

# Using the UCD for Energy Budgeting

**Questions can be answered via the UCD Helpdesk**

Email: [ucdb@aagent.ca](mailto:ucdb@aagent.ca)

Phone: (416) 622-9449 ext. 115