

## 4 Content and Format of Standard Reports

### 4.1 Overview

This chapter provides a summary of the requisite content and format of the COMNET standard reports. The establishment of these reports will standardize the way energy modeling output data is presented to various rating authorities. By standardizing the reports, all rating authorities will be able to view the same building information and evaluate the project for certification, labeling, or tax credit.

#### 4.1.1 Content

Building information is organized into four standard reports:

- Building Summary
- Energy Measures
- Energy Results
- Representations

The Building Summary contains basic building information such as project title, location, and size (see [Figure 4.3.1-1](#) [1]). This brief report provides essential building data at a glance. The Energy Measures report will list the design features that are different between the proposed design and the standard design (see [Figure 4.3.2-1](#) [2]). Credit is offered based on these measures. The Energy Results report will contain a summary of fuel types and end uses (see [Figure 4.3.3-1](#) [3] and [Figure 4.3.3-2](#) [4]). The Representations report will have all relevant building titles and claims (see [Figure 4.3.4-1](#) [5]).

The COMNET reports also include the data necessary to automatically populate the forms required for LEED Online credit EAc1. This includes energy use by orientation, fuel costs and other factors.

#### 4.1.2 Format

There are two COMNET required formats for building information reports: electronic and hard copy. The electronic standard reports will be generated in XML (eXtensible Markup Language). The hard copy standard reports will be in PDF (Portable Document File). Both report formats will be automatically generated by COMNET approved software. Each page of the report will have a header with the project name and date.

## 4.2 Electronic Format: XML

### 4.2.1 Background

The electronic format of the COMNET standard reports will be XML. XML is a broadly used mechanism for describing, storing, and exchanging data. The primary function of XML is to effectively organize data and allow for it to be distributed in a platform independent format. Designating XML as the electronic format for COMNET is not intended to create more work for the user. Rather, XML supplies consistency as well as flexibility to the reporting process. XML facilitates straightforward data transfer from users to rating authorities.

The flow of information from the user (e.g. energy analyst) to the rating authority is summarized in [Figure 4.2.1-1](#) [6]. First, the user inputs the necessary building data into the interface and runs the simulation engine as usual. When the user makes a successful simulation, the COMNET software will generate an XML file and produce the standard reports. This XML file will contain all of the data relevant to a building project for the purposes of rating and tax evaluation. Finally, the XML file can be sent to a rating authority and uploaded into their database for use in certification, labeling or determining tax deductions.



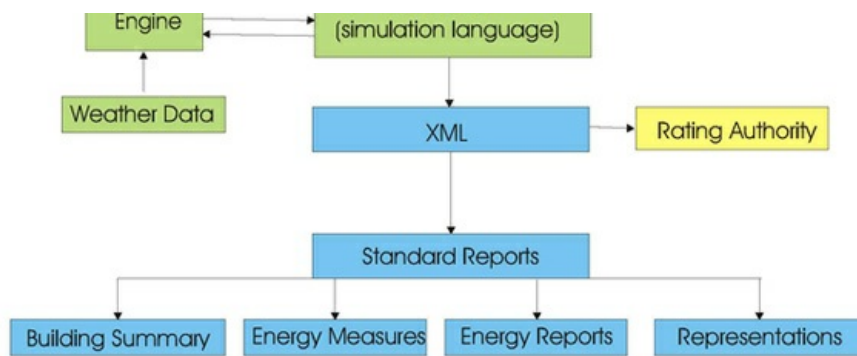


Figure 4.2.1-1: "Information Flow"

## 4.2.2 XML File Structure

The XML data structures are simple, yet comprehensive enough for the user to ensure full transfer of all relevant building information. The four output reports (Building Summary, Energy Measures, Energy Results, and Representations) will be generated from the XML file.

The data structure is a 'many-to-one' relationship. The first structure (Project Data) is the primary or parent object. All successive structures will point back to this parent object. These successive structures have infinite input capability: the same structure can be used as many times as needed to represent the data. [Figure 4.2.1-1](#) [6] outlines the XML structures proposed for the COMNET standard. The XML format would allow for the addition of future structures to adapt to advances and innovation in energy modeling process. The sections below provide more detailed outlines of the elements within the proposed XML data structures.

The COMNET report organization is shown in the pictorial representation of the schema below. The schema contains the following reports:

- The Building Summary Report contains the project data, the stakeholder list, the list of subspaces and LEED EPA data.
- Energy Efficiency Measure Report contains a list of energy efficiency measures.
- Energy Results report contains the energy results, including a breakdown by end use. This report also includes advisory messages and override summary when defaults are overridden.
- Representation Report contains signatory information from qualified parties.

The "E" designates XML data elements, "CT" designates complex data types, and the "A" designates attributes that apply to the data element. The attribute Units is used where needed to designate units.

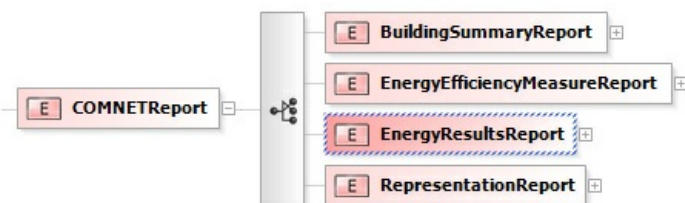


Figure 4.2.2-1: "COMNET High Level Report Structure"

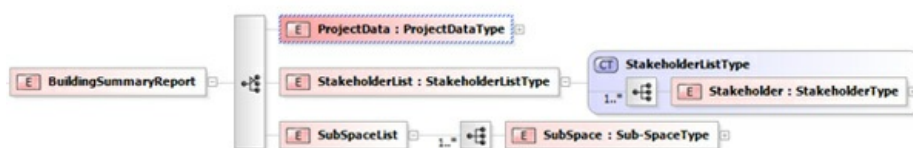


Figure 4.2.2-2: "Building Summary Report Structure"

This contains Project Data, a list of Stakeholders and a list of Sub-Spaces.

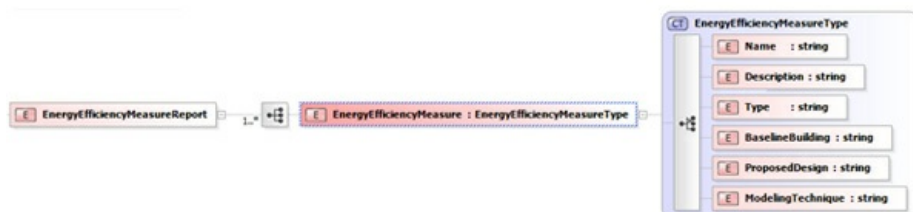


Figure 4.2.2-3: "Energy Efficiency Measure Report Structure"

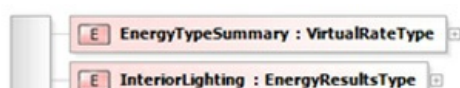




Figure 4.2.2-4: "Energy Results Report Structure"

Note that the Energy Results report contains an "Other" element to accommodate a user-defined number of other end uses not included in the list above.

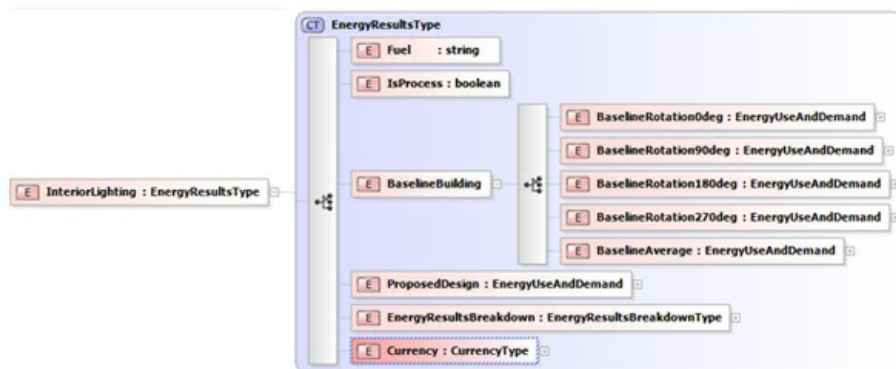


Figure 4.2.2-5: "Sample end use in Energy Results Report Structure"

View of one element in the Energy Results Report – includes energy use by orientation for baseline and end use breakdown by time period.

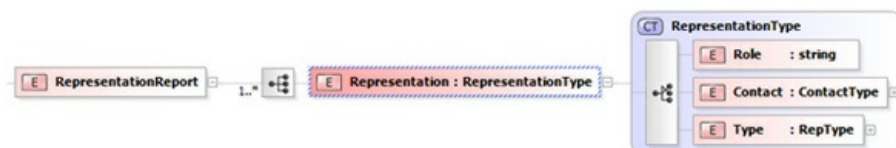
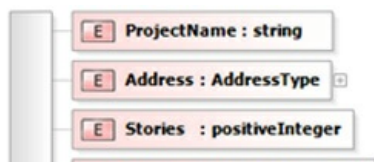


Figure 4.2.2-6: "Representation Report Structure"

The XML Reports defined as part of the schema utilize the following data structures:



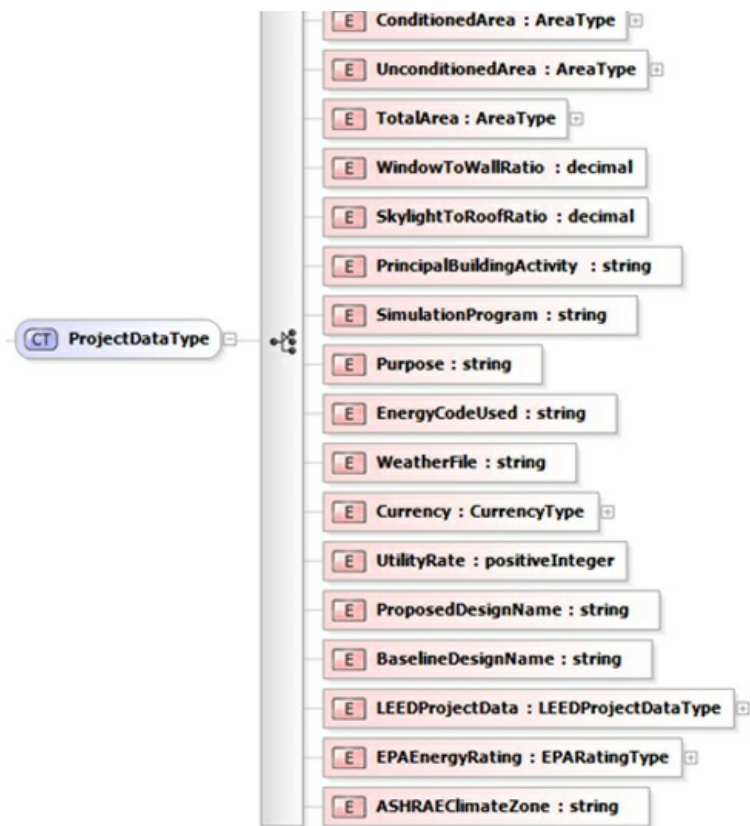


Figure 4.2.2-7: "Project Data data type"

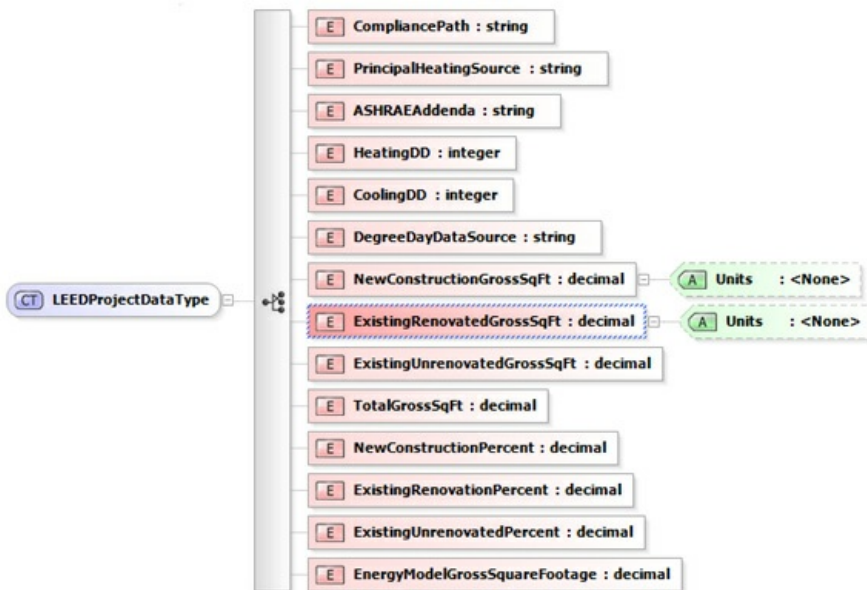


Figure 4.2.2-8: "LEED Project Data data type"

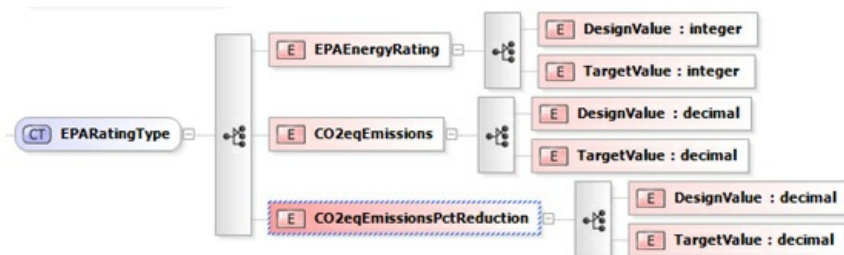
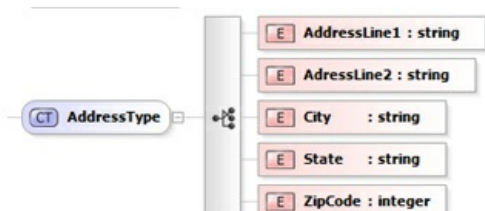


Figure 4.2.2-9: "EPA Rating Type data type"





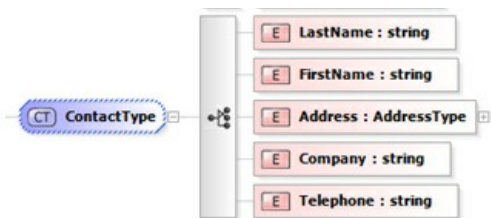


Figure 4.2.2-10: "Address Type and Contact Type - used in the Building Summary report"

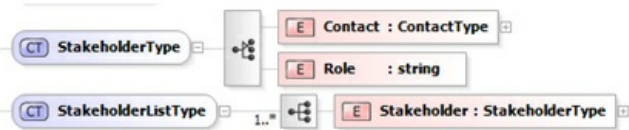


Figure 4.2.2-11: "Stakeholder Type – used in the Building Summary and Representation report"

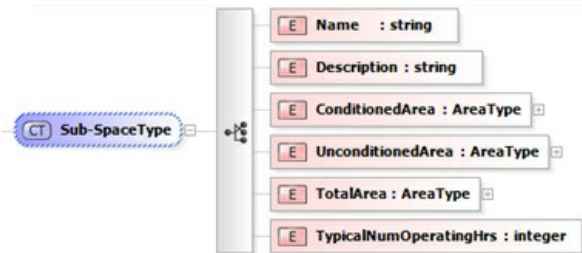


Figure 4.2.2-12: "Sub-Space Type – used in the Building Summary report"

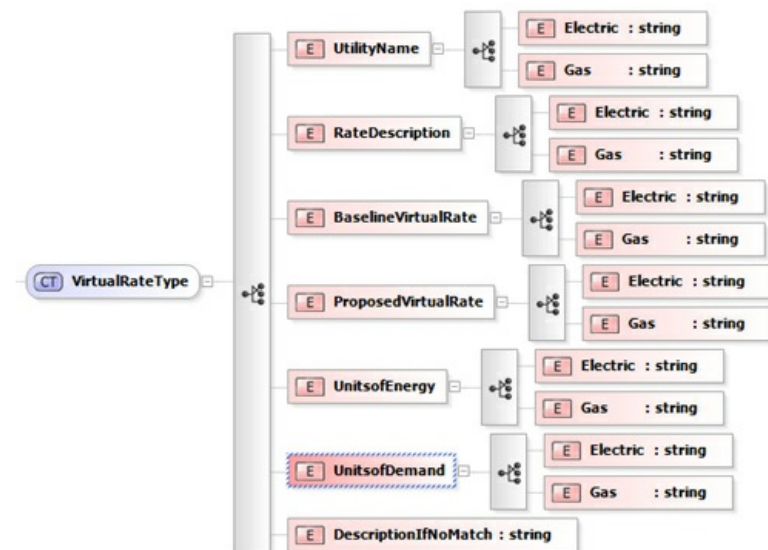


Figure 4.2.2-13: "Virtual RateType – used in with LEED Online reporting"

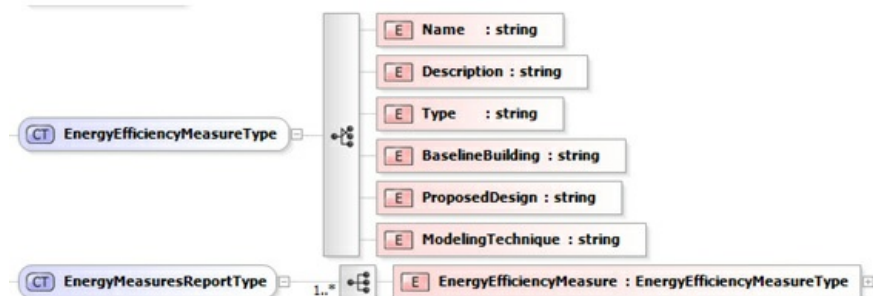


Figure 4.2.2-14: "Energy Efficiency Measure Type"

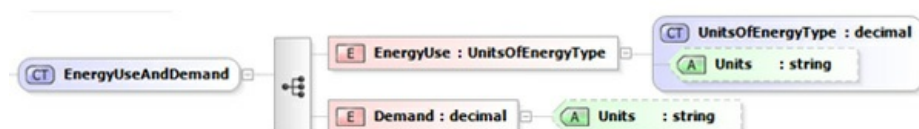


Figure 4.2.2-15: "Energy Use And Demand – used in Energy Results Report"

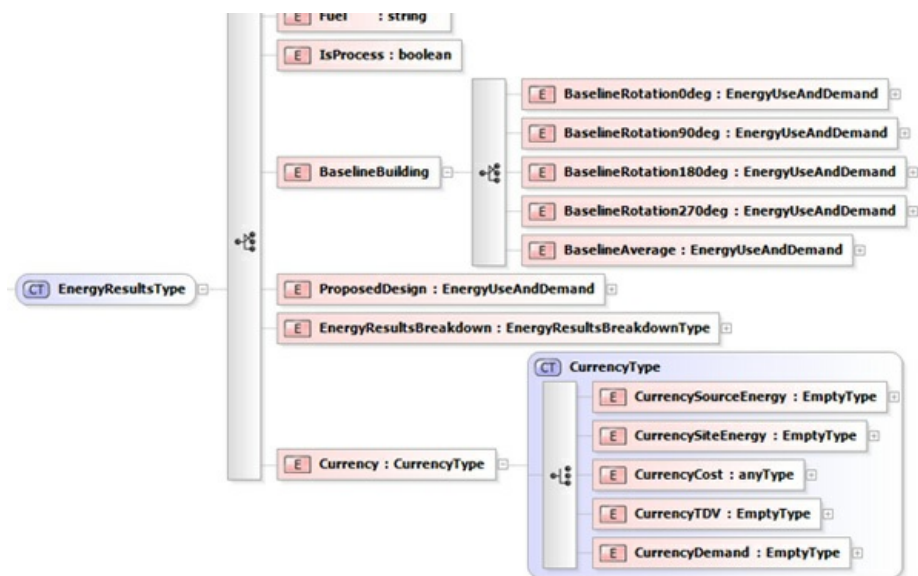


Figure 4.2.2-16: "Energy Results Type – used in Energy Results Report"

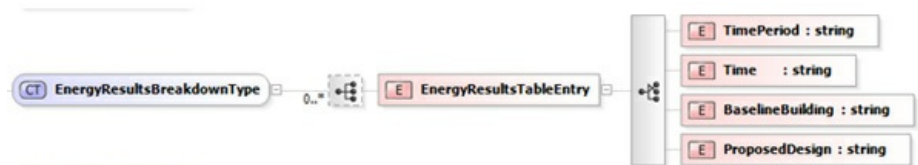


Figure 4.2.2-17: "Energy Results Breakdown Type – used in Energy Results Report"

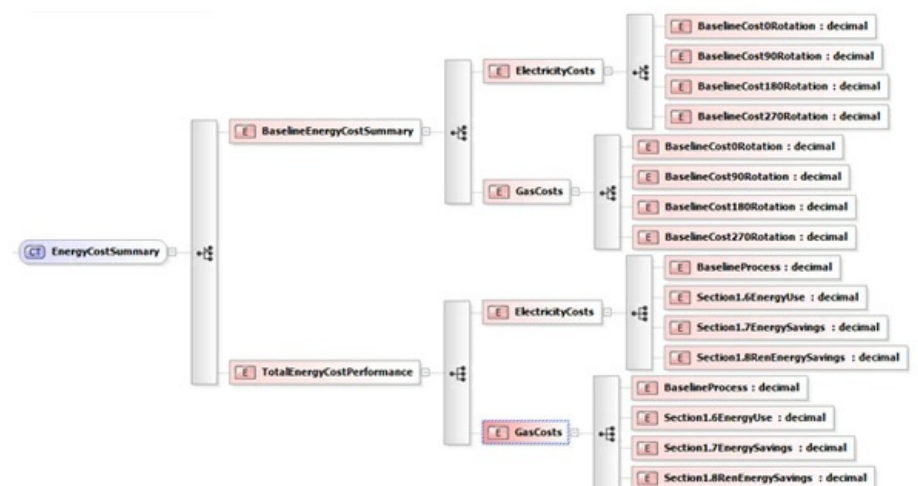


Figure 4.2.2-18: "Energy Cost Summary – in Energy Results report, used in LEED Online Reporting"

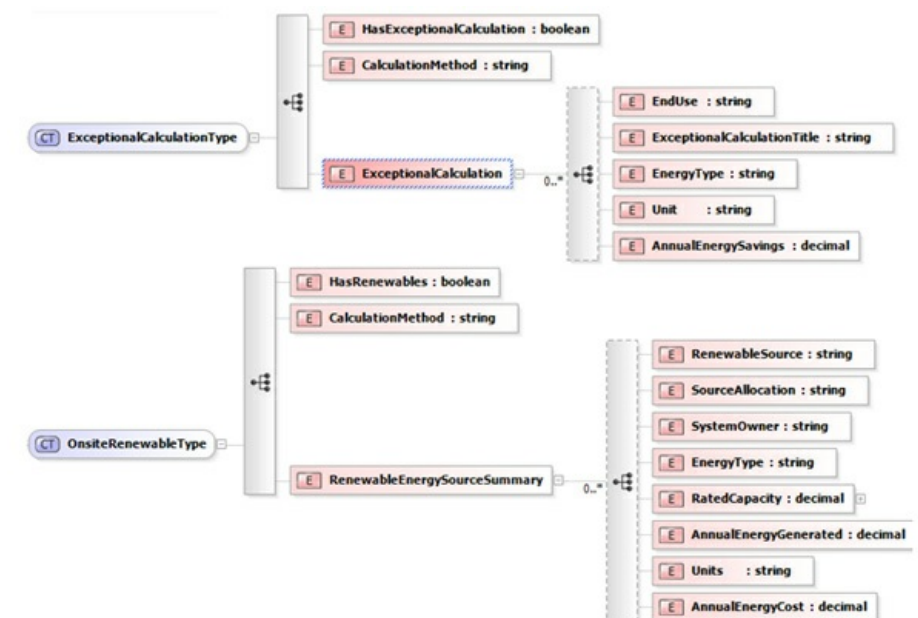


Figure 4.2.2-19: "Exceptional Calculation Type and Onsite Renewable Type – used in LEED Online Reporting"

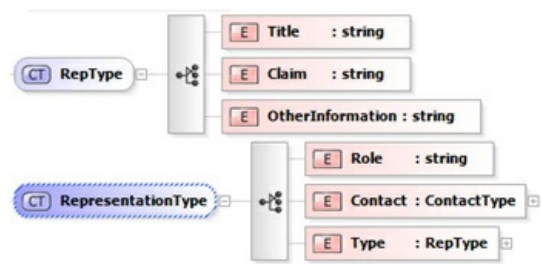


Figure 4.2.2-20: "Rep Type and Representation Type – used in Representations Report"

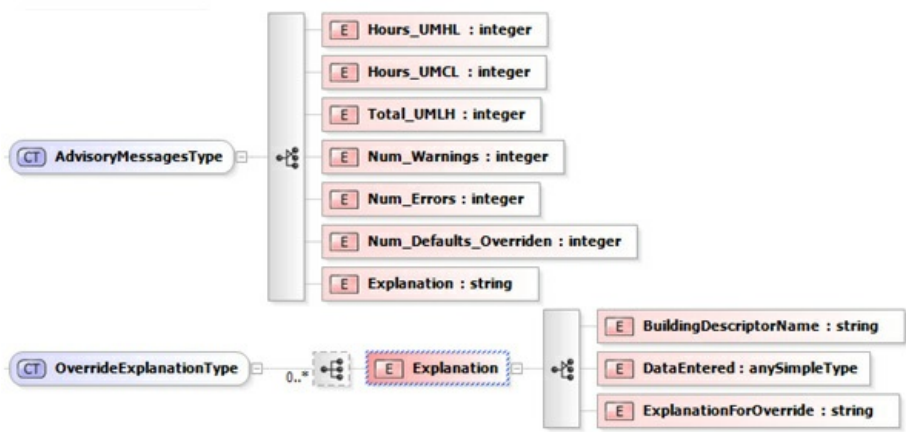


Figure 4.2.2-21: "Advisory Messages Type and Override Explanation Type"

## 4.3 Hard Copy Format: PDF

The COMNET approved software will produce an XML file and PDF reports. The following section provides examples of the automatically generated PDF standard reports: Building Summary, Energy Measures, Energy Results, and Representations. These examples are representative of a typical report output; however, they are not exhaustive.

### 4.3.1 Building Summary

Trenton Office Building		Date	Jun 25, 2009		Page 1 of 2
Project Data Summary					
Project Title	Trenton Office Building				
Address	5467 Sunset Drive				
City	Trenton	State	CA	Zip	94007
Stories	2				
Conditioned Area	51,889	Unconditioned Area	0	Total Area	51,889
Window to Wall Ratio	29.2 %	Skylight to Roof Ratio	0.5 %		
Principal Building Activity	Office				
Simulation Program	VisualDOE 4.1				
Energy Code Used	IECC 2006				
Weather File	TRENTON.bin				

Currency	Site Energy
Utility Rate	N/A
Baseline Design	IECC Compliant

Figure 4.3.1-1: "Sample of First Building Summary Page, Generated by Software"

Trenton Office Building		Date Jun 25, 2009	Page 2 of 2
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**Stakeholders**

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Role Owner

Last Name Prantell

First Name Michelle

Address 897 Whirlwind Road

City Brackfield State CA Zip 93652

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Role Architect

Last Name Havisham

First Name William

Address 4359 Creekside Avenue

City Fenton State CA Zip 91142

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Role Mechanical Engineer

Last Name Evans

First Name Katherine

Address 228 Overland Trail

City Cicely State CA Zip 98865

Figure 4.3.1-2: "Sample of Second Building Summary Page, Generated by Software"

## 4.3.2 Energy Measures Report

Trenton Office Building		Date	Page 1 of 1
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**Energy Measures Report**

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Energy Measure Category	(User Defined)	Energy Measure Description (User Defined)	
		Baseline	Proposed
Envelope	Fenestration	U-value = 0.57 SHGC = 0.49	U-value = 0.29 SHGC = 0.28 Blue tinted, low-e, insulated glazing on all orientations.
	Roof Insulation	R-15	R-25
	Wall Insulation	R-13	R-13 + R-7.5 in i



Lighting	Lighting Power Densities	none	majority of spaces fall below the minimum requirements
	Occupancy Sensors	none	occupancy sensors used
HVAC	VFD on Chilled Water Pumps	none	variable frequency drives placed on chilled water pumps
	High Efficiency Chillers	0.64 kW/ton efficiency chiller	0.51 kW/ton high efficiency chiller
	High Efficiency Fan Motors	none	high efficiency fan motors used

Figure 4.3.2-1: "Sample of First Energy Measures Page, Generated by Software"

## 4.3.3 Energy Results Report

Trenton Office Building		Date Jun 25, 2009	Page 1 of 1
<b>Energy Results</b>			
<b>End Use Summary</b>			
Currency: Source kBtu Time Period: Annual			
	Baseline (kBtu)	Proposed (kBtu)	Difference (kBtu)
Interior Lighting	1,714,287	1,542,935	171,352
Space Heating	2,631,089	2,083,102	547,987
Space Cooling	1,791,255	1,711,089	80,166
Pumps	867,338	744,899	122,439
Fans	1,349,966	1,286,433	63,533
Service Water Heating	67,500	67,500	0
Office Equipment	1,285,651	1,285,651	0
<b>Total Building Consumption</b>	<b>9,707,086</b>	<b>8,721,609</b>	<b>985,477</b>
<b>Percent Savings</b>	<b>10.15%</b>		

Figure 4.3.3-1: "Sample First Page, Energy Results, Generated by Software"

Trenton Office Building

Date Jun 25, 2009

Page 2 of 2

Energy Results

Monthly End Use Summary, By Fuel Type

	Electricity (kBtu)						Gas (kBtu)	
	Interior Lighting	Space Heating	Space Cooling	Pumps	Fans	Office Equipment	Service Water Heating	Total
Jan	143,418	404,101	100,232	72,396	112,681	107,555	5,891	946,274
Feb	130,100	259,339	125,982	65,737	102,316	97,564	5,492	786,530
Mar	154,566	302,842	148,603	77,256	120,244	115,923	6,391	925,825
Apr	138,096	218,637	150,132	70,859	110,288	103,563	5,791	797,367
May	148,998	178,740	166,404	74,451	115,879	111,745	5,991	802,208
Jun	148,263	143,490	169,660	74,369	115,751	111,196	5,692	768,420
Jul	138,820	105,577	163,170	71,286	110,954	104,112	5,292	699,211
Aug	154,566	123,600	178,753	77,428	120,513	115,923	5,592	776,375
Sep	138,096	109,733	169,520	71,391	111,117	103,563	5,092	708,513
Oct	143,418	159,271	163,976	72,081	112,191	107,555	5,392	763,884
Nov	137,127	246,266	145,428	68,812	107,102	102,839	5,292	812,866
Dec	138,820	379,495	109,395	71,271	110,930	104,112	5,592	919,615
Total	1,714,287	2,631,089	1,791,255	867,338	1,349,966	1,285,651	67,500	9,707,086

Figure 4.3.3-2: "Sample of Second Page, Energy Results, Generated by Software"

## 4.3.4 Representations Report

**Representations  
Lighting**

An installation certificate is required to be posted at the building site or made available for all appropriate inspections. (The information provided on this form is required). After completion of final inspection, a copy must be provided to the building department (upon request) and the building owner at occupancy.

**Outdoor Lighting**

- ☒ High Efficacy Outdoor HID luminaires contain only high efficacy lamps, luminaire has factory installed HID ballast.
- ☒ Luminaires providing outdoor lighting and permanently mounted to a building or to other buildings on the same lot shall be high efficacy luminaires OR are controlled by occupant sensors with integral photo control.
- ☒ Lighting for parking lots for 8 or more vehicles shall have compliant lighting. Lighting for parking garages for 8 or more vehicles shall also have compliant lighting.

**Declaration**

- ☒ I hereby certify that compliant product(s) were installed in the building at the above location.

Item #s (if applicable)	Name: Michelle Pramtell 	Owner Pramtell & Associates
	Signature Date Jun 22, 2009	
Item #s (if applicable)	Name: Justin Matisse 	General Contractor Evergreen Construction
	Signature Date Jun 24, 2009	
Item #s (if applicable)	Name: Christine Kelly 	Installing Subcontractor Kelly Lighting Co.
	Signature Date Jun 21, 2009	

Figure 4.3.4-1: "Sample Second Page, Representations, Generated by Software"

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Source URL: <http://www.comnet.org/mgp/content/4-content-and-format-standard-reports>

**Links:**

- [1] <http://www.comnet.org/mgp/content/431-building-summary#sample-of-first-building-summary-page-generated-by-software>
- [2] <http://www.comnet.org/mgp/content/432-energy-measures-report#sample-of-first-energy-measures-page-generated-by-software>
- [3] <http://www.comnet.org/mgp/content/433-energy-results-report#sample-first-page-energy-results-generated-by-software>
- [4] <http://www.comnet.org/mgp/content/433-energy-results-report#sample-of-second-page-energy-results-generated-by-software>
- [5] <http://www.comnet.org/mgp/content/434-representations-report#sample-second-page-representations-generations-by-software>
- [6] <http://www.comnet.org/mgp/content/421-background#information-flow>