Table 1 – Summary Comparison of Existing XML Schemas

Consideration	*gbXML*	*CBECC-Com*	*COMNET*	*EDAPT*	*BuildingSync*
An XML schema exists to constrain input	Yes	No	Yes	Yes	Yes
BEDES Compliant	No	No	No	No	Yes
Accommodates energy results at different time steps	Yes	n. a.	Yes	No	Yes
Designed for existing building audits	No	No	No	No	Yes
Robust and flexible	Yes	n. a.	Medium	Low	High
Designed specifically to capture energy modeling results	No	No	Yes	Yes	No
Already implemented in software	Yes	Yes	Yes	Yes	Yes
Contains the level of detail needed for input to an energy simulation model	Yes	Yes (used for CBECC software)	No	No	Yes (but just for DOE Asset Score)

gbXML and its derivative CBECC are intended as a format for modeling inputs, not outputs. CBECC-Com stores information in an XML format, but there is no schema to constrain inputs. New elements can be added and element names can be changed by the software developers. CBECC-Com software also stores simulation results in an XML format, but again there is no schema or structure that program administrators can use to accurately parse the simulation results. Without a schema, it is really not in a form that can be used as a standard.

The COMNET schema was developed for the explicit purpose of sharing modeling data and for this reason it is compact and focused on this sole purpose. A schema has been developed to constrain and order the data, but because of its vintage, the element names are not consistent with either the Standard Data Dictionary adopted by California or the BEDES dictionary maintained by LBNL. COMNET results for various pre-determined end-uses can be stored at any time step of the simulation. The COMNET schema has been tested and implemented in several software applications and has been used by at least one program administrator. COMNET has also developed a portal through which data is transferred and within which a basic level of data checking is performed.

EDAPT was developed for a similar purpose as COMNET, but is much simpler. Its format can be output from OpenStudio. It works well for its intended purpose, which is to support a website that tracks applications for incentives.

BuildingSync is a large, robust, and complex XML schema which was developed for another purpose, to support energy audits of existing buildings. It is compliant with the BEDES dictionary of terms and the schema does a good job of constraining input. Very few of the elements are mandatory, so it would be reasonably simple to adapt it for the purposes of transferring modeling results. Unlike gbXML and CBECC, it does not have the hierarchical structure and detail needed to generate energy models. It does support input to the DOE Asset Score tool, which is a simulation tool, but one that receives simplified data. BuildingSync also supports information on ENERGY STAR, LEED and other programs, e.g. whether or not the audited building meets the requirements of these programs and the level of recognition received. .

CONCLUSION

There are many benefits to a standard electronic format for sharing energy simulation data. Modelers are less burdened with the task of filling out forms and transferring information. Program administrators have more confidence that the results that make their way to their databases at least agree with the energy models and no errors were made in data transfer.

A widely used and acceptable standard will require input from all stakeholders. Software developers will need to make the investment to add features to their software to produce output in this common format. They need to participate in the process to assure that the information required by the schema can be automatically produced by their software. Program administrators need to participate in the process to

make sure that the information they need is included in the schema. Energy modelers need to understand the standard exchange format and use it.

An organization or owner for the schema needs to be established and its role would be to vet changes to the schema and manage updates in an orderly manner, preferably in a way that is backwardly compatible with previous versions of the schema.

This entity can be a separate organization established for the sole purpose of developing and maintaining the schema, or it can be housed within an existing organization, probably a 501(c)3 non-profit. The governing body should have representation from software developers, program administrators and energy modelers. A formal process should be in place to release updates.

The managing organization needs the flexibility to quickly correct errors or bugs, which means that the XML standard would likely work best if it were NOT an ANSI consensus document.

The tipping point will be when one of the large energy programs (like ENERGY STAR or LEED) begins to require the use of the standard XML schema. Once this happens, and one or more of the dominant software developers implement the standard XML, progress will be made.

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