

Industry perspective on the holistic approach to buildings

The holistic approach to buildings developed by the ISO TC 163/205 Joint Working Group (JWG) and as a result of the EU mandate has opened new opportunities and challenges to the built-environment industry.



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While much of the detailed development has been done within CEN and for the EU, the intent has always been to extend the results through the Vienna Agreement to ISO. **Figure 1** shows the ISO related perspective of the pyramid that illustrates the holistic approach to buildings in a slightly

altered and emphasized manner. One will note that the emphasis is on the very bottom and therefore “base” of the structure namely the product information required to support everything needed to move up the pyramid to the ultimate goal of building performance characterization. This article will focus on and explore this

Continuity from the product to the system energy performance assessment

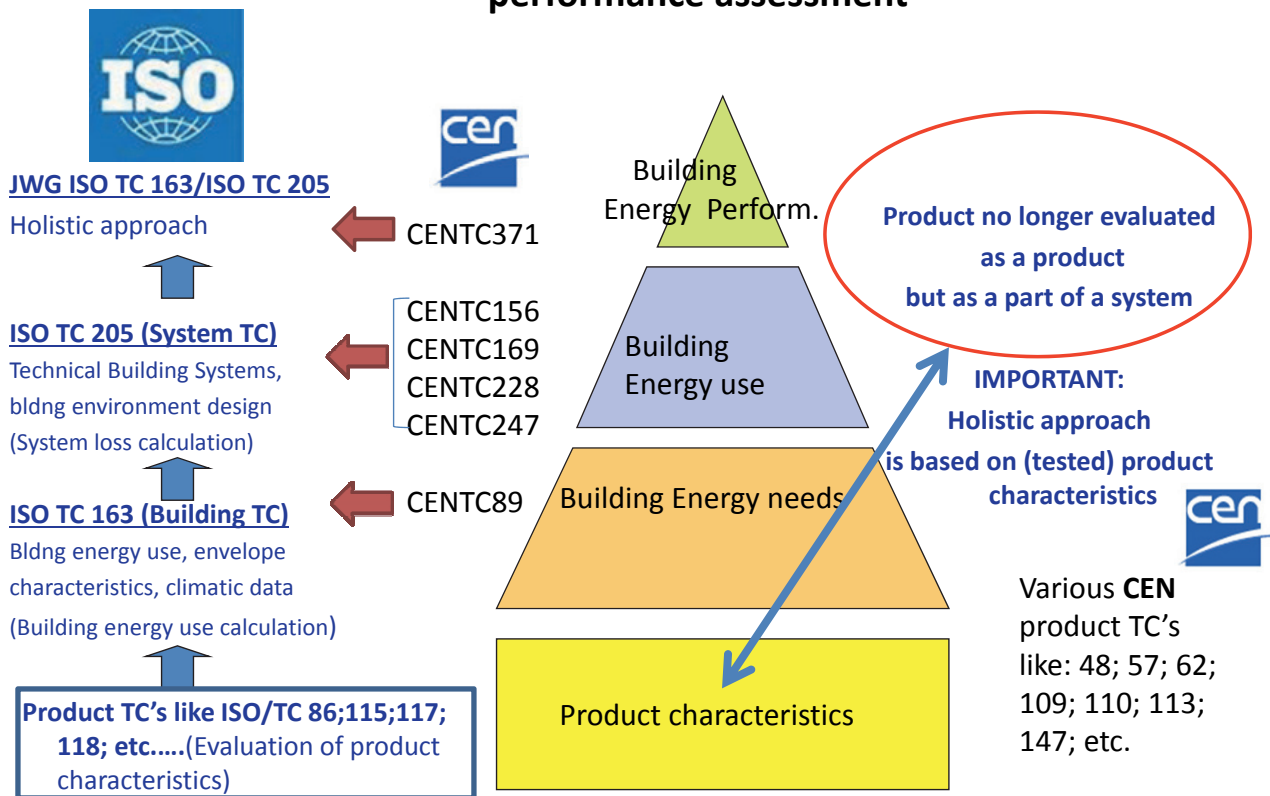


Figure 1. Holistic approach to buildings with ISO related perspective.

bottom rung primarily as it relates to mechanical equipment, sub-systems and systems. One will note in the figure the intent is evaluate products not individually but as part of the system. This is not done lightly and will require a different paradigm from the companies and organizations involved.

The manufacturers of building products and sub-systems have provided information and data about their products in various ways. Some use catalog with tables, suppliers of components to manufacturers that build systems such as air handlers most often use a focused program that can be inserted into the prime movers' program to provide the product data, and some limited products can provide an entire map of their performance throughout the entire application range. All of this information is used in the design of buildings through modeling and other means to arrive at the expected performance of the building. In today's environment, the building's performance has usually been in terms of energy use. What is not always clear is that many products do not have accepted or required energy performance metrics and those that do have limited testing to arrive at the required performance. The Energy Performance of Buildings Directive (EPBD), which is the genesis of the holistic approach to buildings has changed this dynamic. What is now required is a complete characterization of the performance of the building in many different ways. Emissions, source energy focus, and full annual energy use to name a few. Product manufacturers are now being asked to characterize the performance of their product not at design conditions, rather, at any condition the building may see during an average year. The EU has also asked manufacturers to provide information for its ECO-DESIGN mandate which results in a product label for its products and much activity and focus is on this in the manufacturers' companies within the EU. This may or may not be sufficient for the full EPBD.

What is the concern?

As the process has moved along it has always been a concern that since this process developed under the EU mandate and intended for ISO and therefore globalization has done so assuming the product manufacturers know and understand what is going to be required of them now and in the foreseeable future. While it may be true in some cases within the EU, it is not the case in other regions of the world. Product information, technical terms related to inputs and outputs, energy metrics and coverage of the application of performance is not universal nor is it currently designed to be provided in the way necessary to support the EPBD.

The JWG has recognized this and I am the Task Leader of a team that will be providing communication on this need to the built-environment industry at large so as to insure that companies that will be required to provide information, data, and other support will understand the need and move to organize their resources to do so. This is not a trivial task; it will require business leaders to fully understand the complexities of the EPBD and to insure they are fully aware of where their products and services "fit" in this scheme.

As chair of ISO TC 86 Refrigeration and Air Conditioning, I am also keenly aware of the need to insure all products and technologies have coverage in the standards community of the built environment. In addition to ISO and CEN, there are also ASHRAE, Eurovent, AHRI (The Air Conditioning, Heating, Refrigeration Institute) standards, just to name a few, whose efforts should also be incorporated into the Global Community. These organizations need also to be kept informed and fully understand the requirements as the effort moves forward. Today, it is safe to say that there are few product standards or certification programs that provide information and performance characterization of the products to support the holistic approach to buildings. In addition, within ISO, there is not full coverage of all the technologies and products needed to insure all buildings can comply with the EPBD if it is incorporated into the ISO organization. While setting the standards and initial compliance with standards is one part of the effort, sustaining and maintaining the standards on an on-going basis is quite another. It will require another critical look at the ISO organization to fully support the built environment.

Effect on the built-environment industry

Another aspect of the EPBD is the output of all the analysis, calculation, modeling etc. is expected to be the building label as previously mentioned. Building labeling is being used in the EU today and volunteer programs and jurisdictional requirements elsewhere are in play as well. However, at present this is all based on the information that the manufacturers, engineers etc. can provide which, in many cases, is extrapolated from a small set of test points, or empirical data from curves or calculations which in the past have been "good enough" based on the requirements of the project. However, if this building label becomes more important due to type of information it identifies and becomes tied to the asset value of the building i.e. "one has to prove that their building is an A building label to get the financial backing for the project", the level and accuracy

of the information provided will increase in importance. Accordingly, the base of the pyramid information providers, the product manufacturers, will be asked to increase the accuracy of the information of their products in order to move up the ladder to sub-systems and full systems for full characterization of performance. This includes understanding the impact of fuel and the energy transfer of their products. Imagine if you will that a project is designed as an A building and the financial pro forma was based on this outcome and the measurement and verification of the commissioning process resulted in a B building. What happens to the value of the building and what is the impact of the financial evaluation and expected return to the investors/owners if this occurs? I submit that due to that sort of scenario, the level of expectation of the accuracy of the information provided from the EPBD will increase significantly.

Of course, all this is a view of what might happen in the future. At this point, is important for all levels of

the pyramid structure to be very aware of the impact of the information and data provided and insure that attention is paid to its accuracy and adherence to the requirements. While this article primarily focuses on manufacturers of equipment in the mechanical portion of the building I would submit that all of the entities involved in the built-environment could benefit from becoming more involved in understanding the details as it relates to their particular interests.

This article has outlined a very real opportunity and some cautions as we move forward through the EPBD. CEN has developed a matrix which supports the standard development process which must be understood by all members of the community, but especially the product and system providers. It has been the intent of this article to prompt all members of the built environment to get involved, understand, evaluate and organize the resources needed to support the impending CEN-ISO effort so as to not find themselves in an uncompetitive position in the future. ■

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