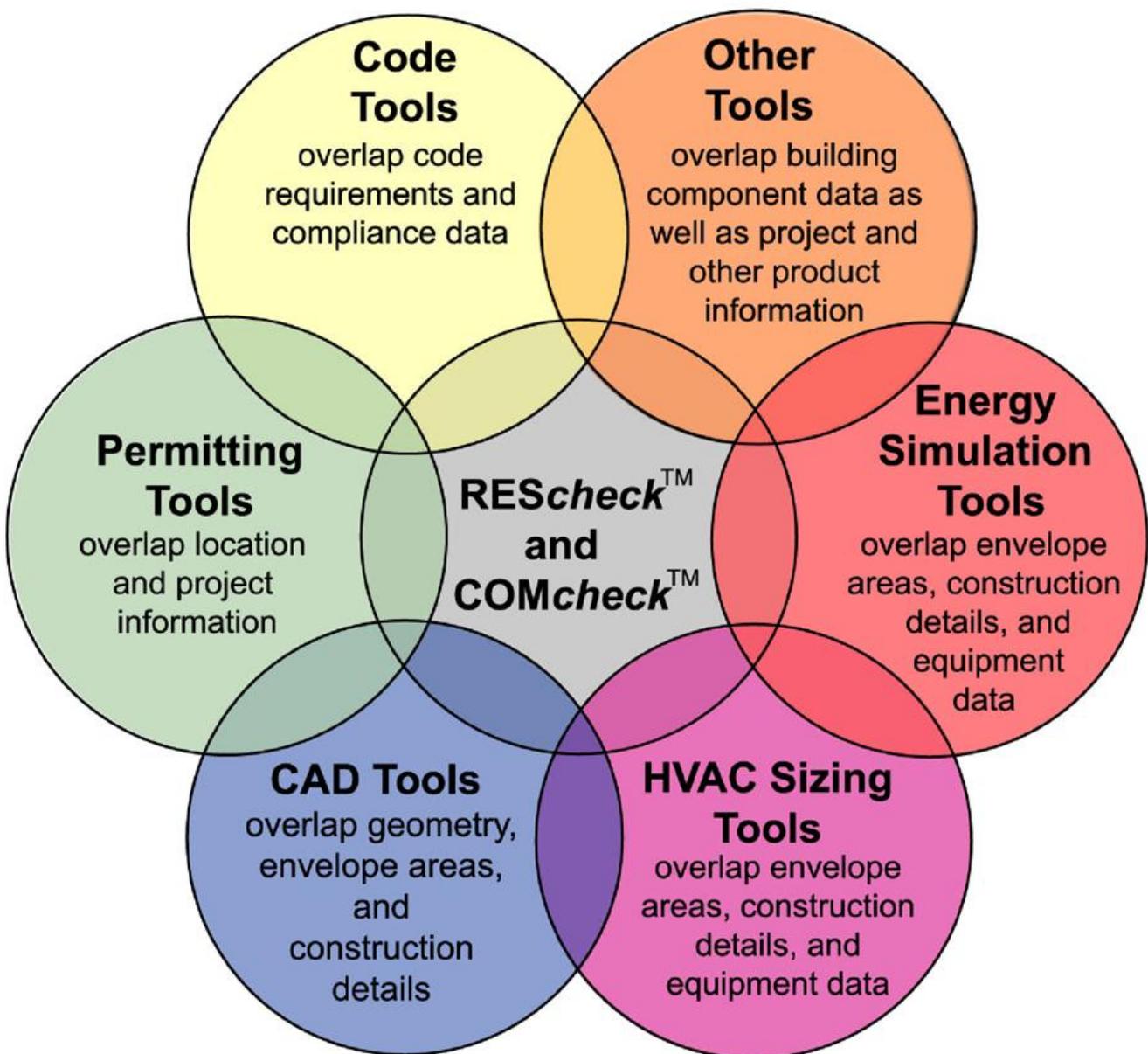




## Building Energy Code Program Tools to Offer Interoperability

Inadequate interoperability in the U.S. construction industry cost an estimated \$15.8 billion dollars in 2004, according to the study, [Cost Analysis of Inadequate Interoperability in the U.S. Capital Facilities Industry](#), conducted by the National Institute of Science and Technology. Interoperability would reduce these costs by allowing data to be shared among building industry applications.

Several of these applications rely on a subset of data used in the Check tools, [REScheck](#) and [COMcheck](#). The Building Energy Codes Program (BECP) team has received many inquiries from building industry software vendors and users regarding the potential interoperability of the Check tools to facilitate energy code compliance.





## Data-Sharing Features of the Future

The BECP software team is responding to the need for interoperability by actively planning for the data-sharing features of the future. The team is currently participating in a new International Code Council (ICC) initiative to develop more direct interoperability capabilities in codes. Also, BECP staff is being supported by the U.S. Department of Energy to develop a Web Service Interface to the Check tools that allows permitting system vendors to interface and field test them with two jurisdictions for electronic submission of code compliance reports.

A second goal of this project is to provide code compliance analysis as a Web Service Interface to the Check tools for permitting system software vendors who could not support all of the information needed for a complete RES *check* ? and/or COM *check* ? analysis.

## Vendors and Users Can Take an Active Role

BECP staff is providing opportunities for software vendors and users to take an active role in interoperability efforts. Vendors and users are encouraged to:

- Sign up to participate in planning activities
- Complete a brief [online survey](#) about interoperability needs
- Join the mailing list at the end of the survey to receive updates about BECP interoperability efforts.

In addition to the survey feedback, vendors and users are asked to specify key applications and tools that are needed for interoperability as well as to share ideas regarding challenges to interoperability, including:

- Developing a common data format
- Developing a method to exchange data among applications
- Translating data in the format used by the vendor to a format usable by the Check tools and vice versa.

These challenges and the measures BECP staff is taking to address them are discussed below.

### Common data format

The BECP team is currently planning to work with the Industry Foundation Classes (IFCs) as a common data format, because it is the most widely used building industry data model. IFCs provide a common data model to represent building objects and construction industry processes using an object hierarchy that enables interoperability with a great degree of flexibility. Any construction industry software application can use the IFC model. At present, several building industry tools have implemented import and export features for IFCs, including CAD systems as well as visualization, estimation, costing, and energy modeling tools.

### Data exchange

Data exchange via Web services is a logical extension for the Check tools -- they now implement Web services for work being performed in collaboration with the National Conference of States on Building Codes and Standards. This effort is supporting data exchange using an XML data format solely for the permitting industry. This feature will make it possible for many types of data exchange with other software tools.

### Data translation

Data translation is the most significant challenge. For almost all applications, the data set exchanged will not be complete. An example in RES *check* is a description of basement walls as required for residential code compliance versus a description as required for HVAC sizing. In the former case, code requirements apply to



the entire basement wall, including the above-grade portion. In the latter case, the software is only interested in the below-grade portion of the wall and may simply ask users for below-grade areas and above-grade areas of walls. Thus, data translation between these two applications is difficult.

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