IPEEC Building Energy Efficiency Taskgroup

- **International Partnership for Energy Efficiency Cooperation (IPEEC):** International forum dedicated to accelerating the adoption of energy efficiency policies and practices.

- **Building Energy Efficiency Taskgroup (BEET):** Governments work collaboratively to research and support the development of effective building efficiency policies.

Argentina	Australia	Brazil	Canada	China	EU	France	Germany
India	Indonesia	Italy	Japan	Korea	Mexico	New Zealand	Russia
Saudi Arabia	Singapore	S Africa	Spain	Turkey	US	UK	

Building Energy Code Project (BEET3)

- Project Partners

- Project Focus
  - Identify key areas for international collaboration on building energy code implementation -- how to realize greater energy savings from codes.
  - Share building energy code approaches and experiences.

- Building Energy Codes Portal
  - www.gbpn.org/beet-3

- Upcoming webinar on code implementation
  - November 12, 2015

Status of Building Energy Code Development & Implementation Globally and in China, France and the USA

MEREDYDD EVANS

Pacific Northwest National Laboratory (PNNL)

Outline

► Introduction and Types of Codes

► What Codes Cover

► Implementation Process and Institutional Roles

► Code Revision Schedule

► Conclusion

What is a Building Energy Efficiency Code?

- ■ Mandatory requirements on building design and construction for improved energy performance
- ■ Minimum requirements for the energy-efficient design and construction/renovation of new and existing buildings

▶ Building Performance Labels vs. Codes:

What Codes Cover

- ▶ Scope of codes:
    - ■ Building elements that may be covered
        - ● Building envelopes (U-value, solar heat gain through windows and window-to-wall ratio, air tightness, shading, and building orientation)
        - ● Lighting
        - ● HVAC
        - ● Service water heating
    - ■ Post-completion in a few countries (for example, commissioning and blower door tests)
- ▶ Building size of threshold can vary by country (none to over 1,000 m^2)
- ▶ Types of buildings:

    Governmental buildings (Brazil), large commercial buildings (India), all buildings (EU Member States, U.S.)

Types of Codes: Mandatory vs. Voluntary

► Working definition: a mandatory code is an implemented code

► Factors:
  ■ Adoption in all or most jurisdictions
  ■ Extent of compliance checks
  ■ Ease of compliance
  ■ Note: Some codes provide flexibility in compliance approach; individual measures are voluntary but not compliance

► Challenging to categorize countries definitively; most important is to work for broad implementation

Types of Codes: Compliance Approaches

▶ **Prescriptive:**

- Specific rules on individual building components (materials, configurations and processes)

▶ **Simple Trade-Off:**

- Specific rules on individual building components, typically to allow trade-offs between elements of the building envelope

▶ **Simulated Performance:**

- A proposed design is run in building energy simulation software to simulate energy use, which is compared either to a reference building or to a specified target

▶ **Point System:**

- Points are assigned, depending on the components used (common in some Asian countries)

▶ **Outcome-Based Code:**

- Rules regulating the actual energy use rather than design (theoretical idea, no full scale examples)

Implementation Process: Options

Plan Review

On-site inspections

How comprehensive and frequent the inspections are?

Commissioning

- ➢ Local governments play a key role in enforcing the building energy codes.

- ➢ Compliance software can be an important tool to mainstream compliance.

- ➢ Building material testing, rating and labelling constitute an important component of any building energy code system.

Government Roles in Codes Process

Governance Level	Roles and Examples
National	Develop codes and provide training and resources Ex: Australia, Canada, India, Mexico
	Develop and adopt codes, provide oversight, coordination and training Ex: China, France, Italy, Japan, Russia, South Africa, Spain, Turkey, UK
Region/ State/Province	Adopt codes; adapt the national code to state requirements, provide technical guidelines, support accreditation Ex: Australia, Canada, China, Russia, United States
Local Jurisdiction	Enforce Codes (almost all countries)

Parties Responsible for Compliance Checking

Design Phase	**Local government** Ex: New Zealand, Spain, United States	**Construction Phase**	**Local government** Ex: Australia, Canada, India, Spain, United States
	Third party Ex: China, France, Singapore, Russia (may involve some review by local government)		**Third party** Ex: China, France, Germany, Italy, South Africa (may include some oversight/inspections from local government)
	National government institute Ex: South Korea		**None** Ex: New Zealand, Russia, Indonesia

Code Revision Schedule

▶ Analyzed 22 countries and only 4 countries have regular schedules.

▶ Clear revision schedule can:
  - Help industry plan and adapt
  - Facilitate more stakeholder involvement.

▶ Frequent updates allow for faster code improvements.

Conclusions

▶ Codes are becoming more common and rigorous.

▶ Implementation is challenging everywhere.

▶ Countries want to learn from each other.