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Energy Codes and High Performance Buildings

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Cadmus

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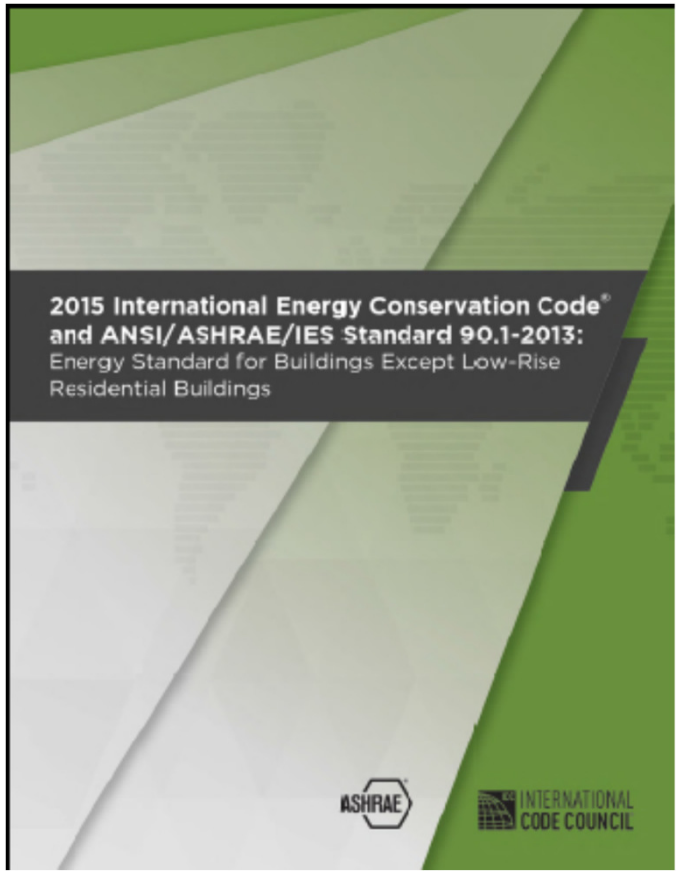
Energy Codes Role in High Performance Buildings



- The minimum (optimum) level of energy efficiency required by law, or
- Stay out of the way and don't create barriers, or

Where We Are with Code Provisions that Support High Performance Buildings

- IRC Provisions
  - Unvented attics
  - Conditioned crawlspaces
  - Framing reduction
  - ACCA Manual D
  - Mechanical ventilation
  - Insulate under radiant floors
- IECC Provisions
  - Insulation installation and air leakage
  - Envelope leakage testing
  - Duct leakage testing
  - ACCA Manual J and S
  - Solar ready

What Did We Add in 2018 IECC to Support High Performance Buildings?

IECC - Residential
IRC - Energy

2016 GROUP B COMMITTEE ACTION HEARINGS

APRIL 17, 2016 – APRIL 27, 2016
KENTUCKY INTERNATIONAL
CONVENTION CENTER
LOUISVILLE, KY

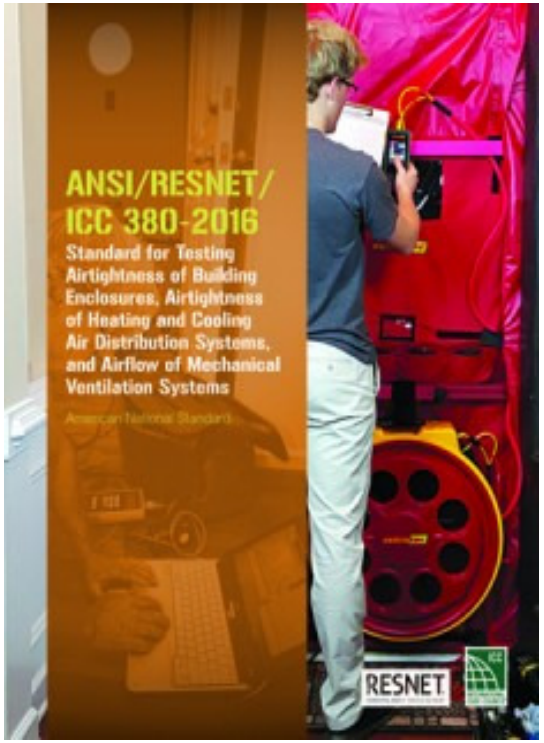
Air Sealing and Insulation Installation Table

- Requires supply and return register boots to be sealed to the subfloor or drywall
- Requires recessed lights to be sealed to the finished surface
- Requires spaces behind electrical/phone boxes to be insulated

Envelope – Glazing U-factors

Table R402.1.2 Insulation and Fenestration Requirements by Component		
Climate Zone	**2015 Glazing U-factor**	**2018 Glazing U-factor**
1	NR	NR
2	0.40	0.40
3	0.35	0.32
4	0.32	0.32
5	0.32	0.30
6	0.32	0.30
7	0.32	0.30
8	0.32	0.30

RESNET/ICC 380-2016 for Building Envelope Testing



Standard for Testing Airtightness of Building Enclosures, Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems"

- Provides clear guidance on how to conduct an envelope air leakage test
- Standard will be used by all HERS raters in the industry
- Standard 380 allows for single point test In addition to multipoint as required by ASTM E 779

Ductwork

- Allows for ductwork to be buried in insulation

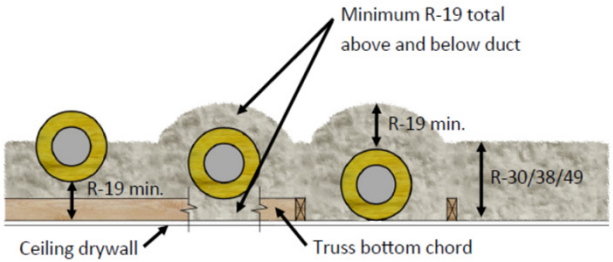


Figure 2. *Example partially buried duct (left), buried duct across the truss bottom truss chord (middle), and buried duct on the ceiling (right).*

Home Innovation RESEARCH LABS™

Fan Efficacy

TABLE R403.6.1 (N1103.6.1)
WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM FAN EFFICACY–

FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY (CFM/WATT)	AIR FLOW RATE MAXIMUM (CFM)
HRV or ERV	Any	1.2 cfm/watt	Any
Range hoods	Any	2.8 cfm/watt	Any
In-line fan	Any	2.8 cfm/watt	Any
Bathroom, utility room	10	1.4 cfm/watt	< 90
Bathroom, utility room	90	2.8 cfm/watt	Any

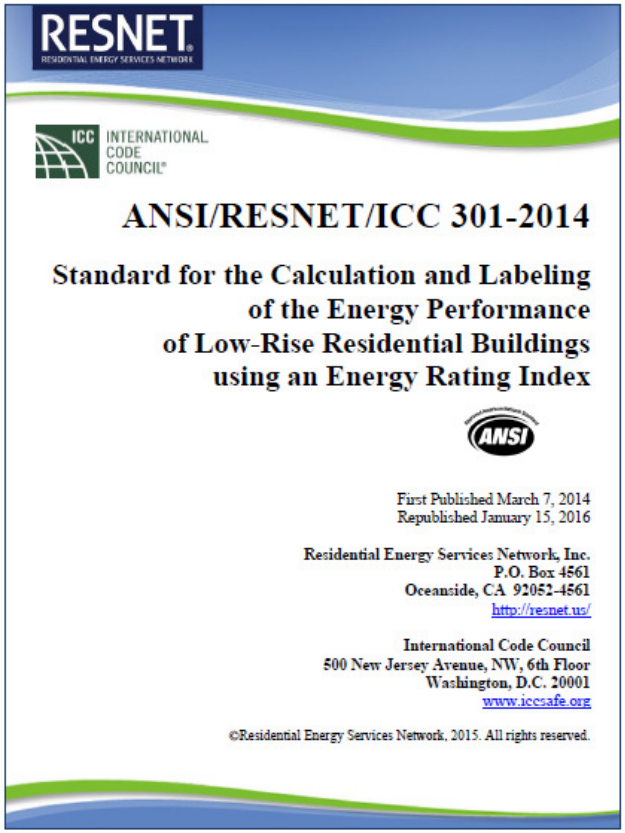
For SI: 1 cfm = 28.3 L/min.

ERI Approach and Renewables

- 2015 “backstop” if taking credit for renewables
- 2009 “backstop” if not taking credit for renewables
- Increased ERI scores

2018 IECC ERI Scores		
Climate Zone	2018 ERI Score	2015 ERI Scores
1 – 2	57	52
3	57	51
4	62	54
5	61	55
6	61	54
7-8	58	53

ERI Approach and ANSI/RESNET/ICC 301-2014


RESNET
RESIDENTIAL ENERGY SERVICES NETWORK
ICC INTERNATIONAL CODE COUNCIL
ANSI/RESNET/ICC 301-2014
Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index
ANSI
First Published March 7, 2014
Republished January 15, 2016
Residential Energy Services Network, Inc.
P.O. Box 4561
Oceanside, CA 92052-4561
http://resnet.us/
International Code Council
500 New Jersey Avenue, NW, 6th Floor
Washington, D.C. 20001
www.iccsafe.org
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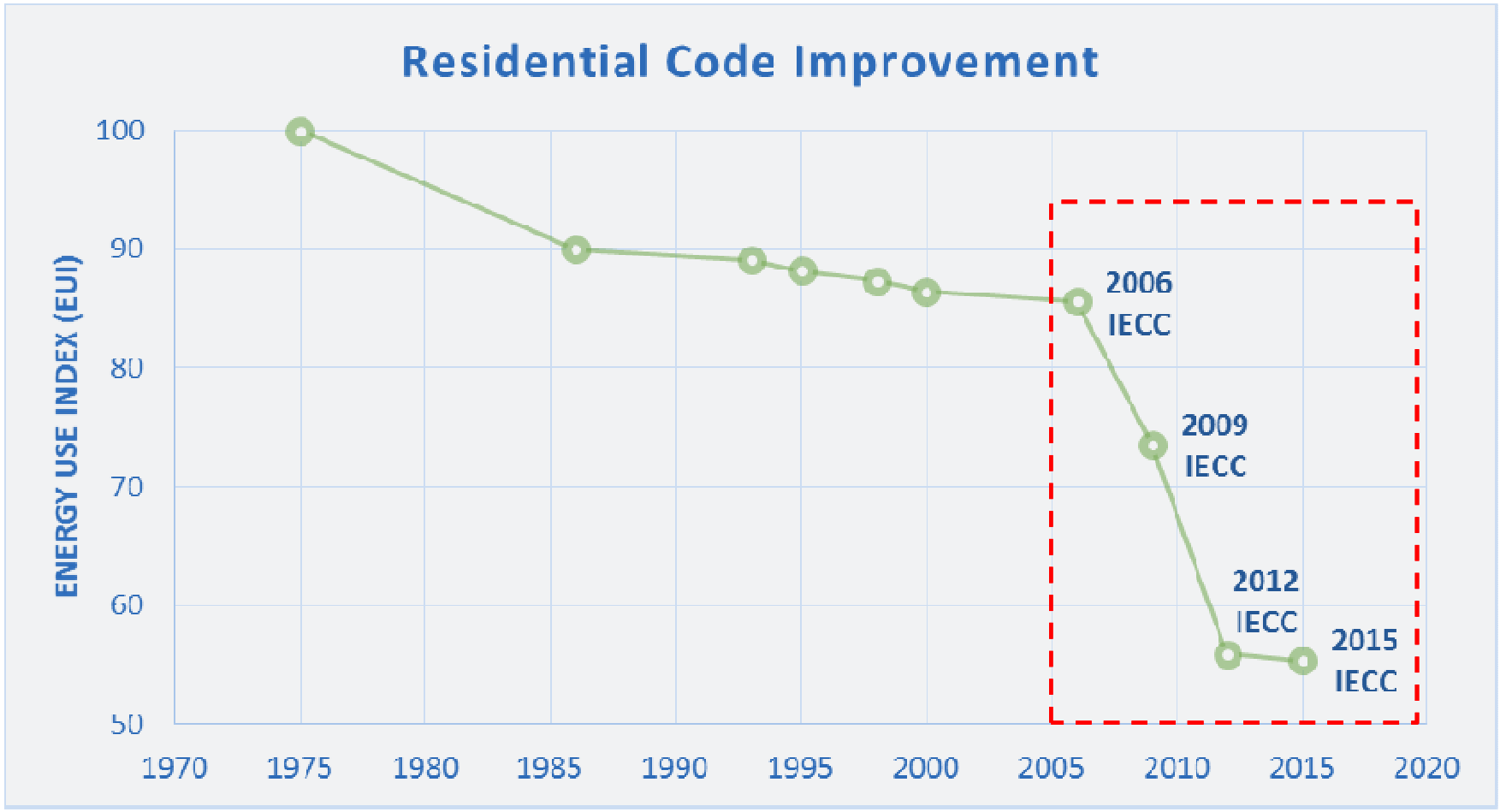
- RESNET/ICC 301 as a basis for the ERI approach
  - Gives credit for on-site power production
  - Defines renewables
    - Solar energy
    - Wind energy
    - Biomass

Lighting Equipment (Prescriptive)

- A minimum of 90 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps

Where Do I Think That We Are Going?



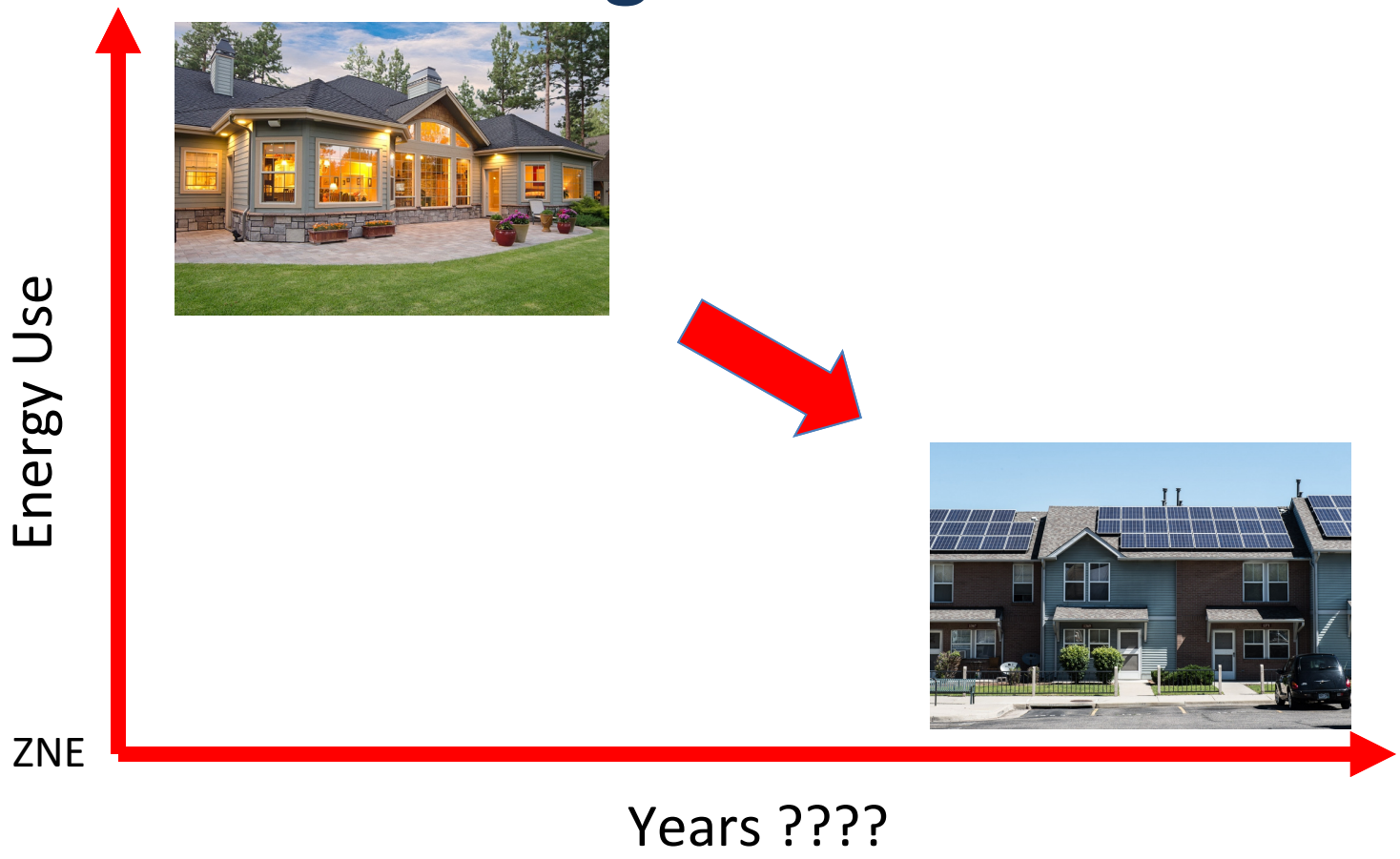
Code Development Process Theory

Code Development Process Reality

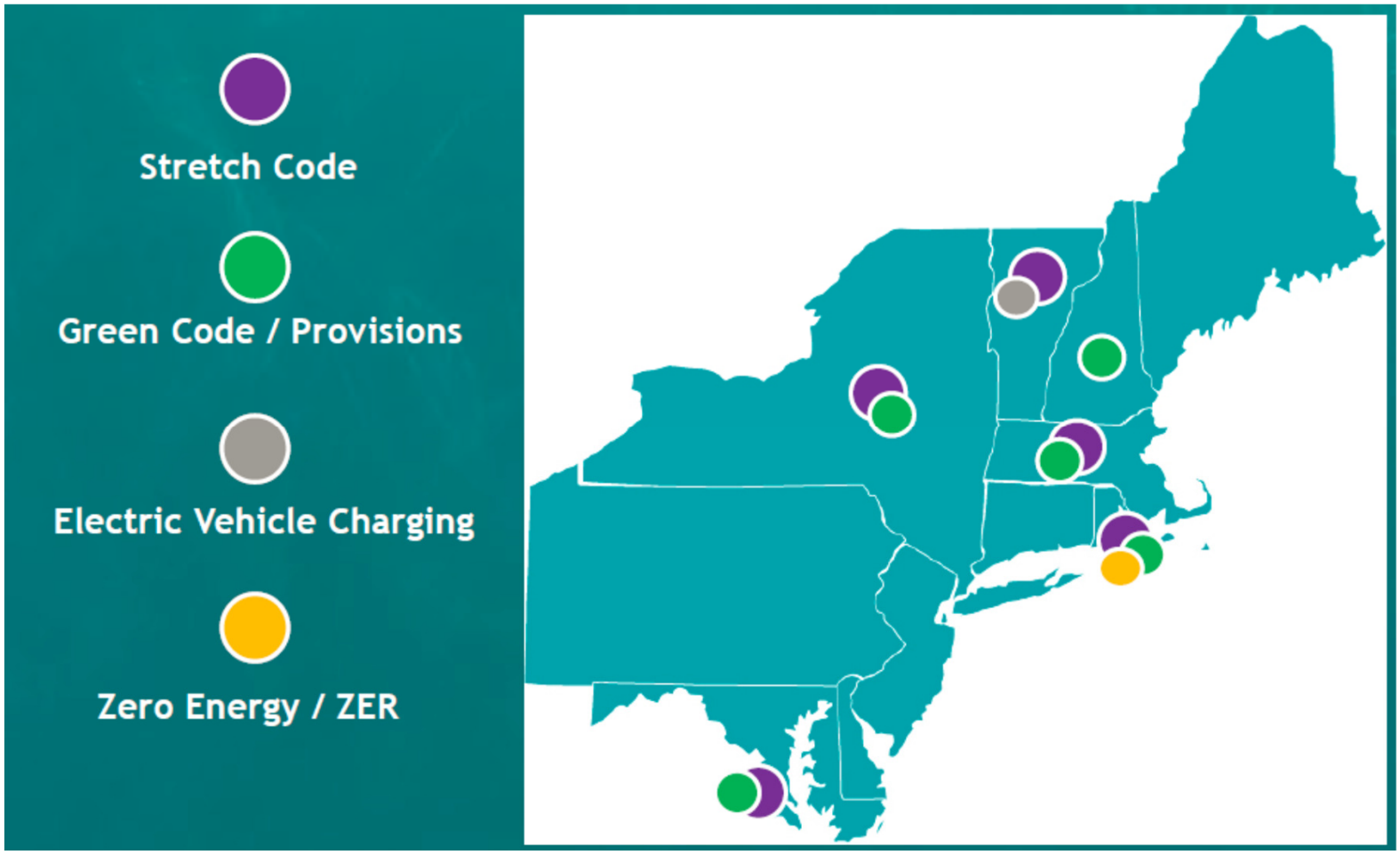
Where Do I Think That We Are Going?

- Short Term
  - Focus on better compliance with energy codes
  - Focus on increasing quality of construction practices
  - Reflect innovative construction practices that can save energy

Where Do I Think That We Are Going? Long Term



Driven by Market Pull Activities



Source: Northeast Energy Efficiency Partnership

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