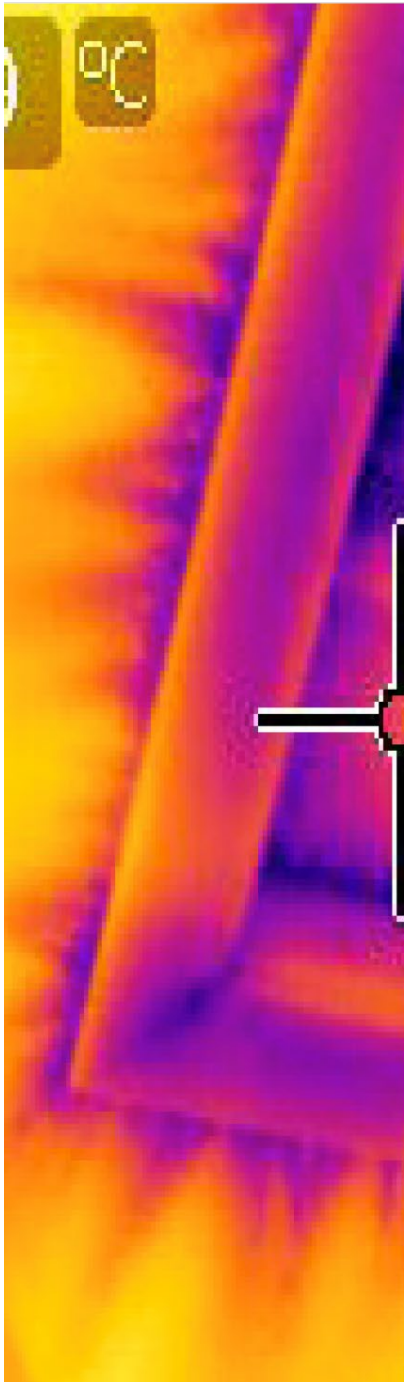


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Presentation

Introduction to Tier Code NBC 2020

Issue Date: 2023 OCT 23

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Introduction to Tier Code

NBC 2020 9.36



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Introduction



Tyler Hermanson
Director and Sr. Consultant

Architectural Technologist, Cert. Energy Manager, Cert. Building Commissioning Professional, Energy Advisor, Green Rater Quality Assurance Designer, EA Quality Assurance Specialist, HRSA Ventilation Designer.

Design – Consultation
Verification – Testing

LEED Canada for Homes Provider 2010
Built Green Standards Member since 2006
EnerGuide Cert. Energy Advisor since 2006


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Agenda



Introduction
Development and Drivers



Structure and Pathways
Understanding Pathways
9.36 Structure and Layout




Effects
Peak Cooling Load Limit
Blower Door Testing
Pushing to Higher Tiers

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Introduction to Tier Code

Understanding the new NBC 2020 and 9.36 changes



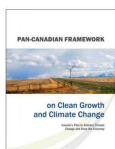
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Drivers

Pan-Canadian Framework

Provinces and territories adopt "net-zero energy ready new construction" in model building code by 2030 and agree to improve energy efficiency of existing housing and buildings





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1970's Energy Crisis

1970

1990

2010

2030

2050

6

1977 Saskatchewan Conservation House




1970

1990

2010

2030

2050

7

1977 Saskatchewan Conservation House



1970

1990

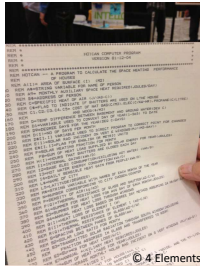
2010

2030

2050

8

1981 – Start of Energy Modeling



1970

1990

2010

2030

2050

9

1982 - Release of R2000



1970

1990

2010

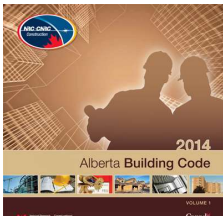
2030

2050

10

2017 – Alberta Building Code

- First time Energy Efficiency is "codified"
- Huge changes to industry to meet 9.36



1970

1990

2010

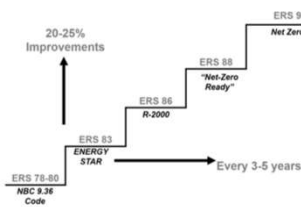
2030

2050

11

2020 – Building Code to Step Code

- New approach to Energy Performance
- Stepped approach targeting Net Zero Energy Ready



1970

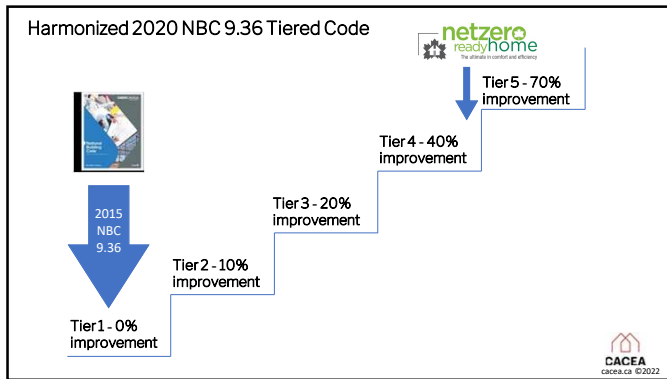
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2010

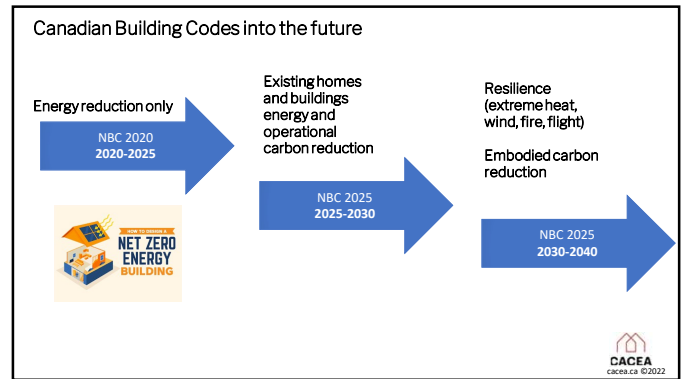
2030

2050

12



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Objective Statements of ABC 2014 Div. A Part 2

OE Environment

OE1 Resources

... resources will be used in a manner that will have an unacceptable effect on the environment ... those caused by:

OE1.1 – excessive use of energy

2014 Alberta Building Code

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Objective Statements of NBC 2020 AB.ED.

OE Environment

OE1 Resources

... resources will be used in a manner that will have an unacceptable effect on the environment ... those caused by:

OE1.1 – excessive use of energy

2019 National Building Code - Alberta Edition

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Changes for NBC 2022 Ab. Ed.

Existing Code

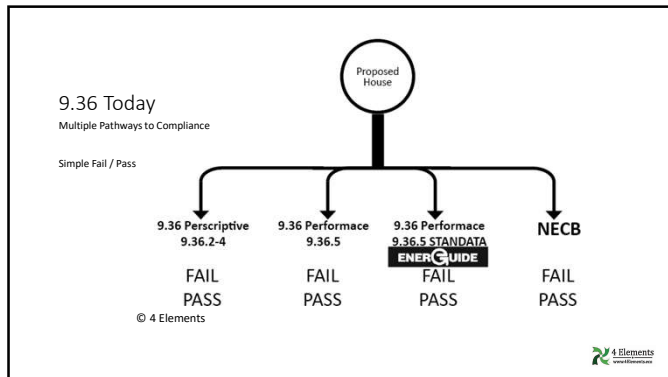
- 9.36.1 Application and Compliance
 - All tiers, all paths
- 9.36.2 - 9.36.4 Prescriptive Path, Tier 1
 - Reference house specification
- 9.36.5 Calculation of Performance Compliance
 - Modeling requirements includes all tiers

New Subsections in NBC 2020

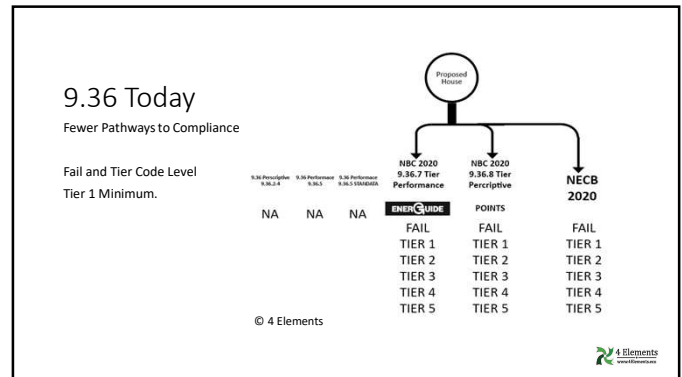
- 9.36.6 Air tightness of Building Envelopes, all tiers
- 9.36.7 Performance Path – Improvement targets, Tiers 1 - 5
- 9.36.8 Prescriptive Path – energy conservation points, Tiers 1 & 2
 - No prescriptive path for Tiers 3 - 5

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Division B **9.36.7.3.**

Table 9.36.7.2.
Energy Performance Tiers for Buildings and Houses
Forming Part of Sentence 9.36.7.2.(1)

| Total Volume of Conditioned Space Within the Building or House | Energy Performance Metrics | Target Energy Performance | | | | |
|--|--|------------------------------------|--------|-------|-------|-------|
| | | Applicable Energy Performance Tier | | | | |
| | | 1 | 2 | 3 | 4 | 5 |
| > 300 m ³ and where volume is not determined | Percent heat loss reduction ⁽¹⁾ | n/a | ≥ 5% | ≥ 10% | ≥ 20% | ≥ 40% |
| | Percent improvement ⁽²⁾ | ≥ 0% | ≥ 10% | ≥ 20% | ≥ 40% | ≥ 70% |
| | Percent house energy target ⁽³⁾ | ≤ 100% | ≤ 90% | ≤ 80% | ≤ 60% | ≤ 30% |
| ≤ 300 m ³ | Percent heat loss reduction ⁽¹⁾ | n/a | ≥ 0% | ≥ 5% | ≥ 15% | ≥ 25% |
| | Percent improvement ⁽²⁾ | ≥ 0% | ≥ 0% | ≥ 10% | ≥ 30% | ≥ 60% |
| | Percent house energy target ⁽³⁾ | ≤ 100% | ≤ 100% | ≤ 90% | ≤ 70% | ≤ 40% |

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Scope and Application

| | Homes | Homes w. Sec. Suite | Multi family | Business, Personal service, Mercantile and Low hazard (300m ²) | Mixed Use (300m ²) | Mixed Use (>300m ²) |
|--|----------------------------------|---------------------|---------------|--|--------------------------------|---------------------------------|
| 9.36.1.3 Compliance and Application | | | | | | |
| 9.36.2 - 4 Prescriptive | YES | YES | YES | YES | YES | |
| 9.36.5 Performance | YES | YES | YES (limited) | | | |
| 9.36.6 Air Tightness | Where used in modeling or 9.36.8 | | | | | |
| 9.36.7 Tier: Performance | YES | YES | YES | | | |
| 9.36.8 Tier: Prescriptive | YES | YES | YES | | | |
| NECB | YES | YES | YES | YES | YES | YES |

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Scope and Application

| | Homes | Homes w. Sec. Suite | Multi family | Business, Personal service, Mercantile and Low hazard (300m ²) | Mixed Use (300m ²) | Mixed Use (>300m ²) |
|--|----------------------------------|---------------------|---------------|--|--------------------------------|---------------------------------|
| 9.36.1.3 Compliance and Application | | | | | | |
| 9.36.2 - 4 Prescriptive | YES | YES | YES | YES | YES | |
| 9.36.5 Performance | YES | YES | YES (limited) | | | |
| 9.36.6 Air Tightness | Where used in modeling or 9.36.8 | | | | | |
| 9.36.7 Tier: Performance | YES | YES | YES | | | |
| 9.36.8 Tier: Prescriptive | YES | YES | YES | | | |
| NECB | YES | YES | YES | YES | YES | YES |

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Changes Prescriptive Pathway

- Tier 1 & 2 only
- Upgrades in Prescriptive for space heating and water heating
 - Typical furnace now 95% (up from 92%)
 - DHW now uses UEF instead of EF (for gas-fired)
 - 50 gal gas fired tank now ~0.55 UEF (was ~0.58 EF)
 - DHW uses standby loss for electric
 - More calculations required for performance modeling (non-ERS)
 - HRV required

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Changes Performance Pathway

- Applies to all Tiers Performance Pathway - 9.36.7
- EnerGuide compliance now part of code: 9.36.5.3 (1)b
- Prescribed flow exponent of 0.67
 - How do we model this? Question for the team/ NRCan
- 2.5 ACH only available for proposed homes when testing will be completed
 - 3.2 ACH prescribed for homes that will not be tested
 - Reference house still modeled to 2.50 ACH (3.00 ACH allowed if home to be tested, unguarded)



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9.36.6 Air Tightness

- Air tightness testing required where used in modeling or Tier Points
 - Pathway remains for compliance without testing
- Additional clarity on testing standards – CGSB-149
- Choice between guarded and unguarded
 - As-operated (CGSB 149-10)
 - Will help attached homes comply



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Air Tightness Targets

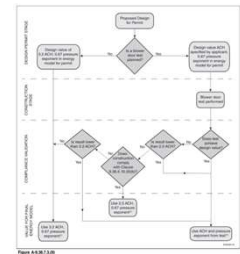
- 3.2 ACH – Typical assumed tightness for homes following 9.25
 - Basic sealing
- 2.5 ACH – Typical assumed tightness for homes following
 - 9.36.2.9 continuous, CSA A440 window and install, airtight fireplaces
 - 9.36.2.10 air barrier details



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Air Tightness Targets – What if Builder Fails?

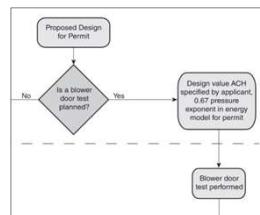
- NBC 2019 AE has no pathway for failing to meet 2.5 ACH
- NBC 2020 Clarifies:



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Air Tightness Targets – What if Builder Fails?

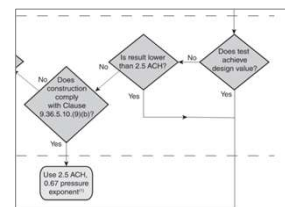
- NBC 2019 AE has no pathway for failing to meet 2.5 ACH.
- NBC 2020 clarifies:
 - Blower door test
 - OR
 - ACH 3.2 (penalty)



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Air Tightness Targets – What if Builder Fails?

- NBC 2019 AE has no pathway for failing to meet 2.5 ACH.
- NBC 2020 clarifies:
 - Blower door test or,
 - ACH 3.2 (penalty)
- If construction is compliant with 9.36.5.10, then ACH 2.5
- If construction is not compliant, then 3.2 ACH



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Air Tightness Targets – What if Builder Fails?

- Who confirms as-built compliance with 9.36.5.10 air barrier detailing?
 - What if a poly inspection was not done by SCO?
 - Default will be ACH 3.2 unless third party verification done
- As long as builder has construction to 9.25 compliant air barrier, Tier 1 failure cannot be caused by air tightness
 - Tier 2 and above depending on points or modeled performance at 3.2 ACH



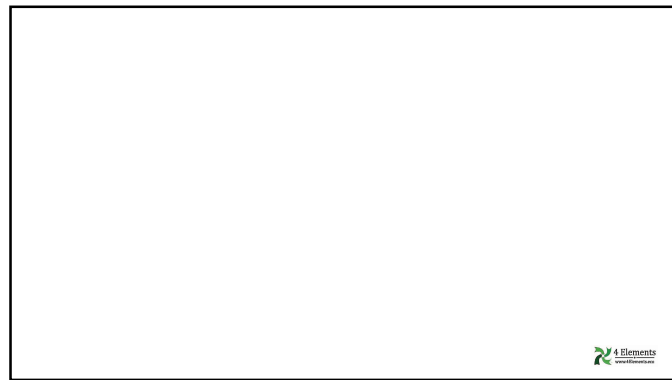
31

Effects of Tier Code

How adoption of Tier code will affect Builders and SCO's



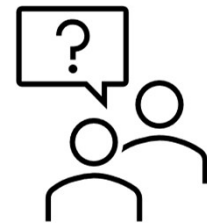
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Questions?

Thank you



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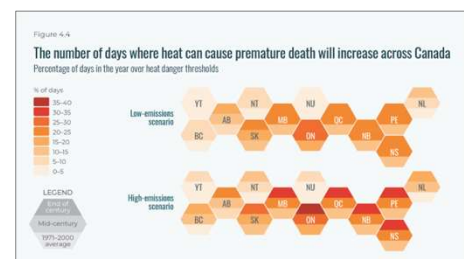
Key Changes – Tier 1

- | | |
|---|--|
| <ul style="list-style-type: none"> • Prescriptive <ul style="list-style-type: none"> • Continue to comply as before • Minor increase in min. Eff. Req. • HRV is now mandatory • Must follow air barrier requirements of 9.25.3, 9.36.2.9 and 10 • Air tightness testing not required | <ul style="list-style-type: none"> • Performance <ul style="list-style-type: none"> • Continue to comply as before • EnerGuide is included • Peak cooling must be evaluated • Air tightness testing not required |
|---|--|



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Peak Cooling – 9.36.7.3



<https://climateinstitute.ca/>



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Peak Cooling – 9.36.7.3

- 619 people died in BC in one week during 2021 heat dome
- Majority died in their homes



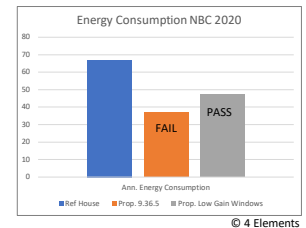
<https://www.cbc.ca/news/canada/british-columbia/b-c-heat-dome-review-recommendations-1.6938700>



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Peak Cooling – 9.36.7.3

- CHBA Concerns
 - Homes that pass peak cooling may still overheat
 - Mechanical cooling does not help in compliance
 - Passive cooling (nighttime ventilation, open windows)
 - Exterior shades? Code implications, modeling implications



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NBC 2020 AB Ed. Concerns and Questions

- Reporting and verification requirements
 - Proposed vs. As-Built
 - Air tightness, volume, opaque assemblies, and windows
- Calculations required (Tier 2 and above)
- Air barrier verification; poor compliance with 9.36.2.9 – 10.
- Increase use of EnerGuide for compliance; reliance on energy advisors
- Who can do the Airtightness Test?



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What are Energy Advisors?



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Our Mission

To support a sustainable profession of successful and credible Canadian Energy Advisors (EA).

Our Mandate

Ensure credible, skilled members and be a valued, respected sector partner.

Our Members

Includes EAs, suppliers, stakeholders and allies, and those in the process of becoming registered EAs.

Members across Canada access to:

- **knowledge and information;**
- **a supportive network;**
- **a unified voice** to influence change; and
- **discounts** to equipment, training, and more.

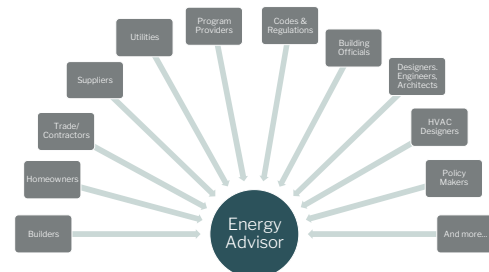
Contact

Cindy Gareau, Executive Director
manager@cacee.ca · 888-315-2774 · www.cacee.ca

CACEA promotes sustainable building practices and contributes to the following Canadian Home Labeling Programs: **R-2000**, **ENERGY STAR**, **ENERGY STAR for Homes**, **ENERGY STAR for Commercial Buildings**, **ENERGY STAR for Schools**, **ENERGY STAR for Universities**, **ENERGY STAR for Government Buildings**, **ENERGY STAR for Hospitals**, **ENERGY STAR for Museums**, **ENERGY STAR for Libraries**, **ENERGY STAR for Parks**, **ENERGY STAR for Places of Worship**, **ENERGY STAR for Retail**, **ENERGY STAR for Restaurants**, **ENERGY STAR for Hotels**, **ENERGY STAR for Airports**, **ENERGY STAR for Universities**, **ENERGY STAR for Government Buildings**, **ENERGY STAR for Hospitals**, **ENERGY STAR for Museums**, **ENERGY STAR for Libraries**, **ENERGY STAR for Parks**, **ENERGY STAR for Places of Worship**, **ENERGY STAR for Retail**, **ENERGY STAR for Restaurants**, **ENERGY STAR for Hotels**, **ENERGY STAR for Airports**.

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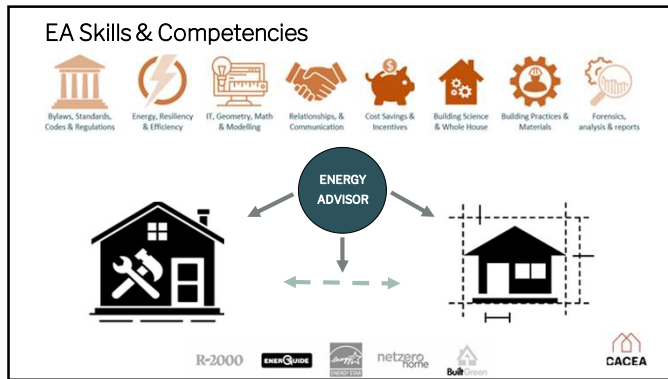
EAs are at the Centre of Part 9 Residential Buildings



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Next Steps

- CACEA is here to help!
- Talk to an experienced Energy Advisor OR CACEA Master Energy Advisor in your area

Master Energy Advisor
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 Cooper Le
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Discussion?

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Thank you!

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