

**28 YEARS OF LEADERSHIP**

**ICYNENE®**

# Spray Foam Insulation For an Energy Efficient Home

# Who is Icynene Inc.?

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- Founded in November, 1986 in Toronto Canada
- Product : soft low density foam insulation.
- A Green product
  - which uses water as the agent of expansion
  - contains no HCFC's, HFA's, formaldehyde
  - PBDE's or volatile organics.
- BBA, ETA, IAB certified
- Tested & Approved by The Fraunhofer Institute
- Approved by AMICA , The European Association for the environmental & Chronic Toxic Injury.

# Who is Icynene Inc.?

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- An air barrier and insulation in one which is breathable
- Breathability is 0.0049 L/s-m<sup>2</sup> at 75Pa of pressure
- Standard for any material to be considered an air barrier is less than 0.02 L/s-m<sup>2</sup> at 75Pa according to the only known standard ASTM E-283
- Icynene is vapor open and facilitates vapor diffusion and bi directional drying

# The Icynene Insulation System®

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- Icynene Inc. is a member of Green Building organizations around the world
- The product has been used in “Health Houses” for asthmatics sponsored by the American Lung Association
- 28 years of experience and over 300,000 buildings of all types insulated –schools, hospitals, museums, art galleries, laboratories, churches, factories, residential







eircom







**Air Seal Spray Foam**

# Air Seal Spray Foam Insulation

087 9884820 087 9078166

[www.airsealsprayfoaminsulation.ie](http://www.airsealsprayfoaminsulation.ie)



The Icynene  
Insulation System

Healthier, Quieter,  
More Energy Efficient



















thermoloc  
BREATHABLE SPRAY FOAM INSULATION



  
**thermoloc**  
BREATHABLE SPRAY FOAM INSULATION

THE  
ICYNENE  
INSULATION SYSTEM

Tel: 028 9244 9590

Web: [www.thermoloc.com](http://www.thermoloc.com)

loc in the heat ... loc out the cold...





























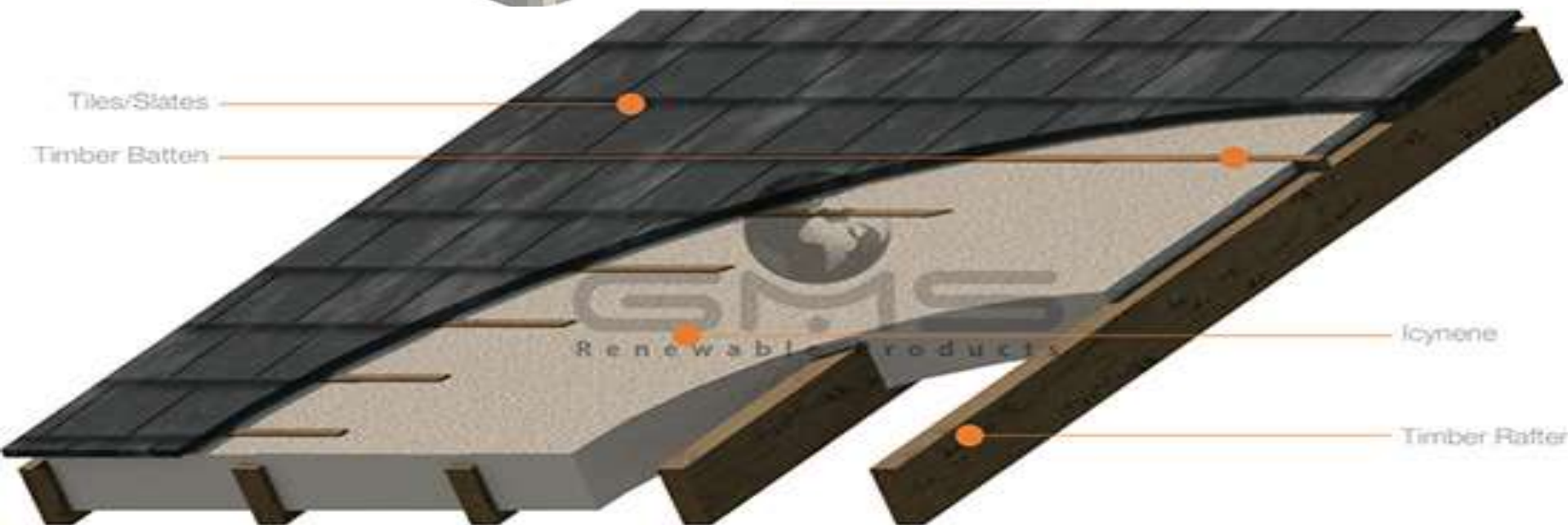
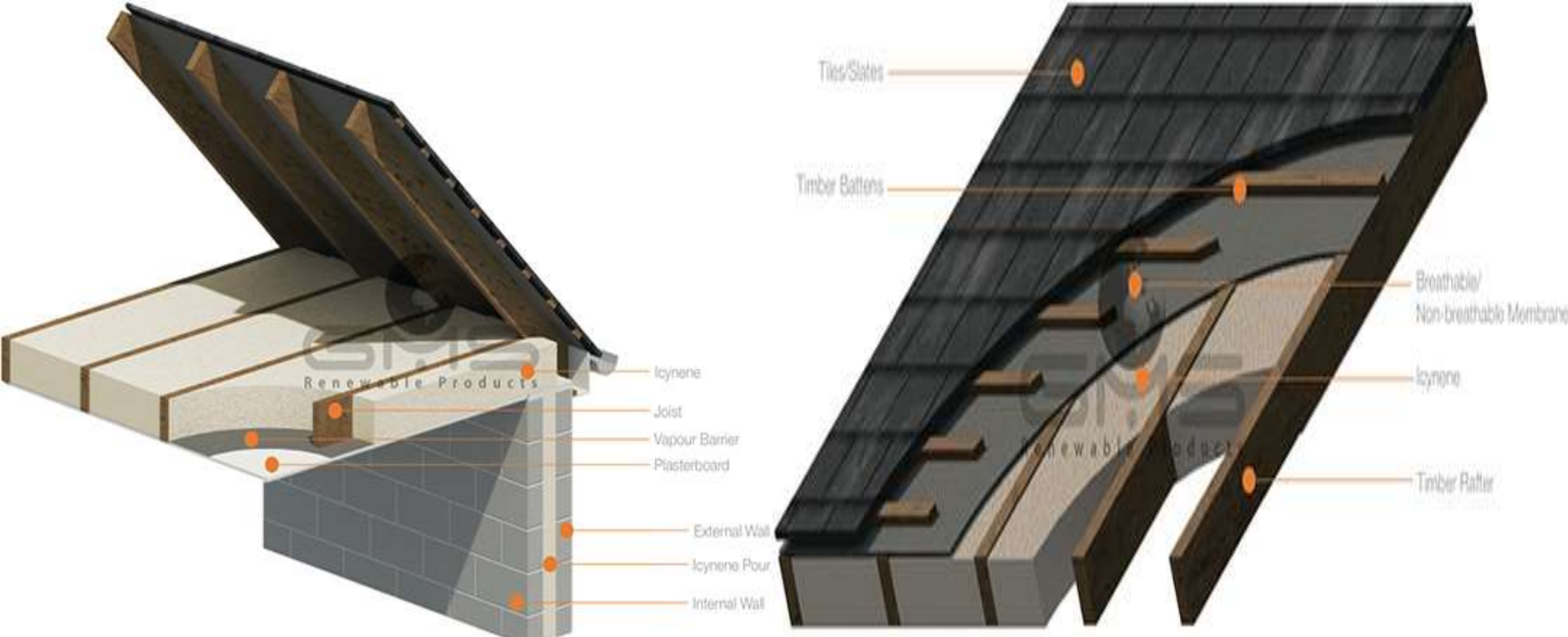


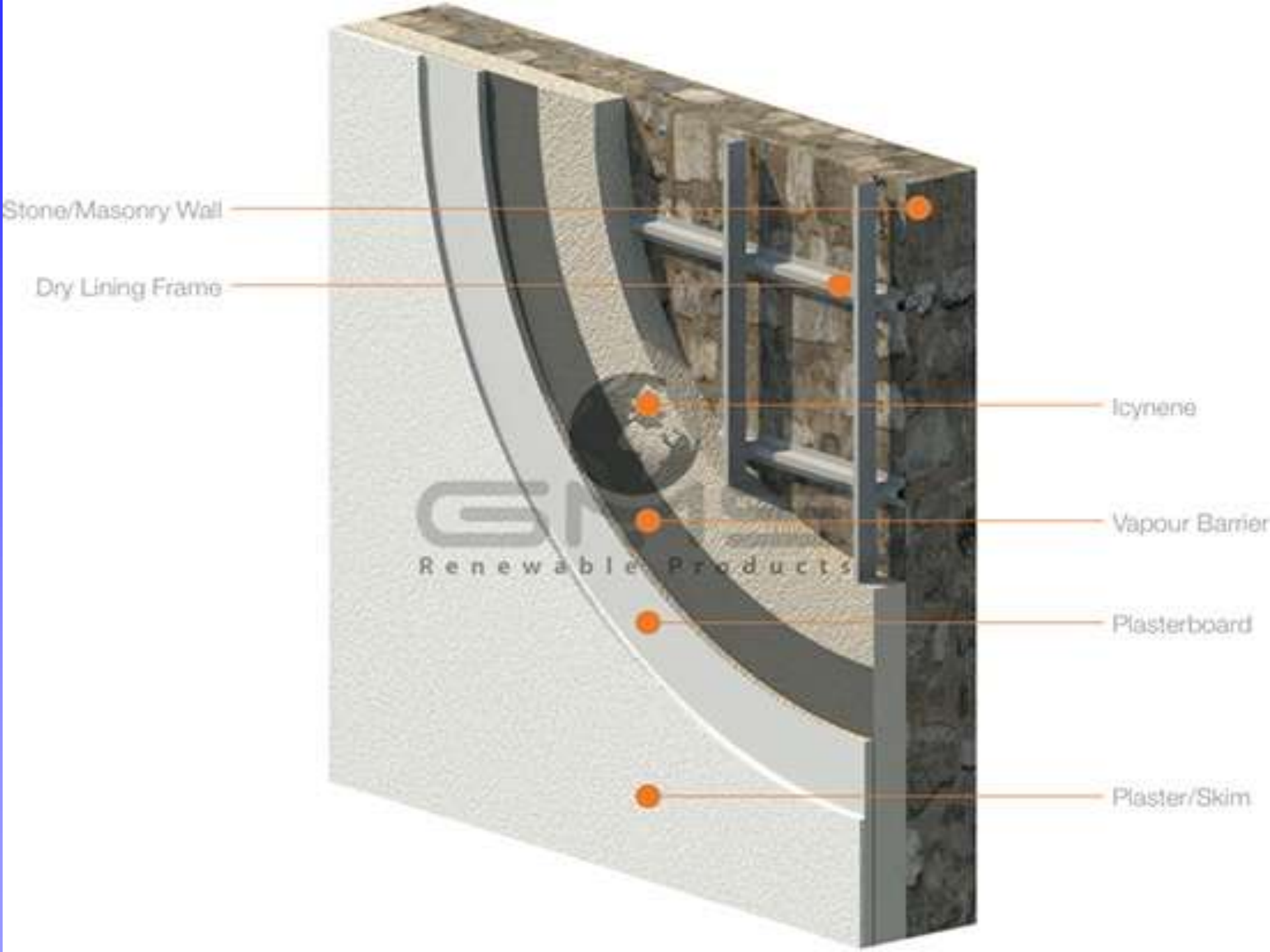












Stone/Masonry Wall

Dry Lining Frame

Icynene

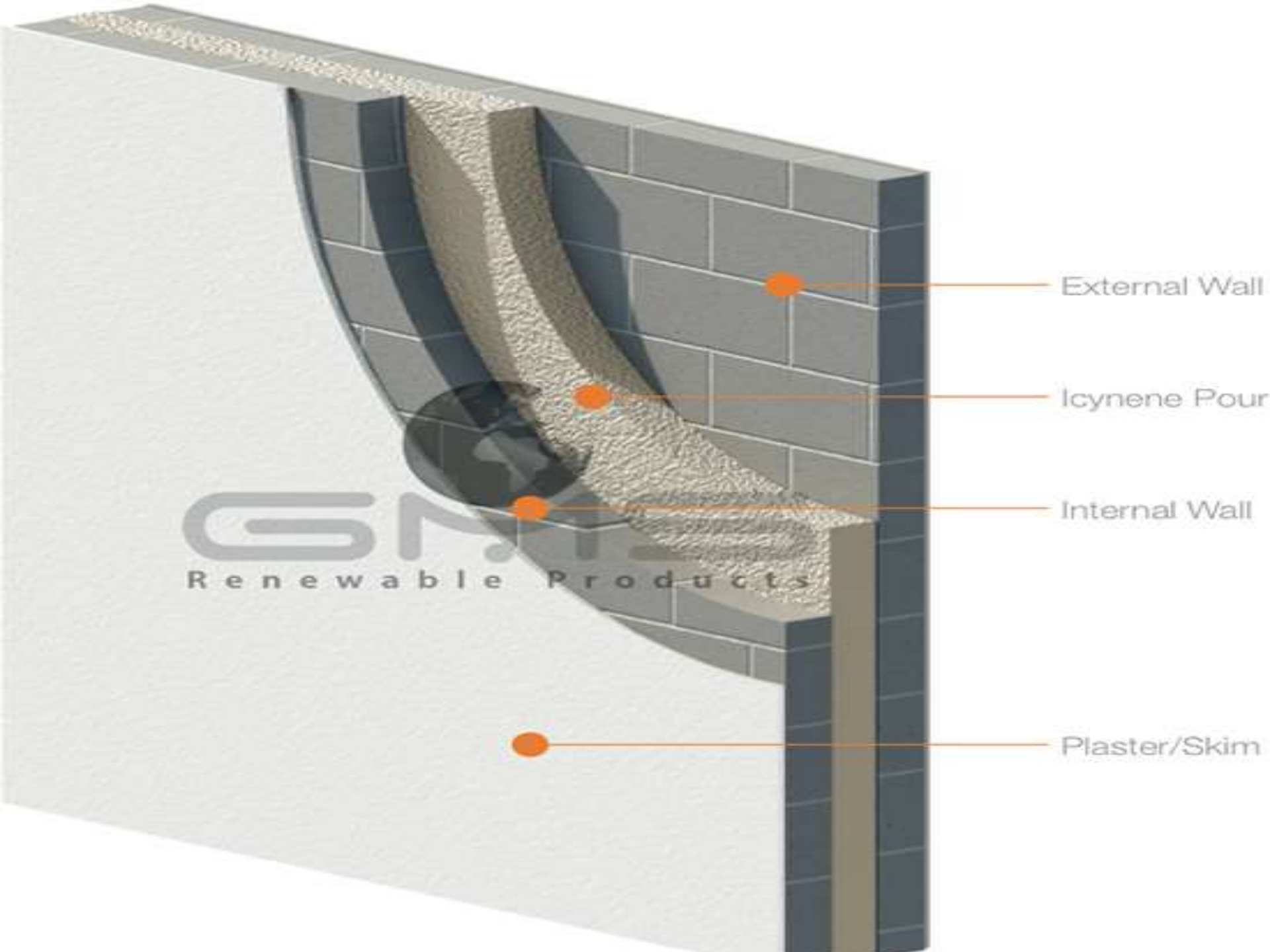
Vapour Barrier

Plasterboard

Plaster/Skim

GI  
Renewable Products





External Wall

Icynene Pour

Internal Wall

Plaster/Skim

GN  
Renewable Products

Breather Membrane

Timber Battens

External Wall

Sarking Board

Isynene

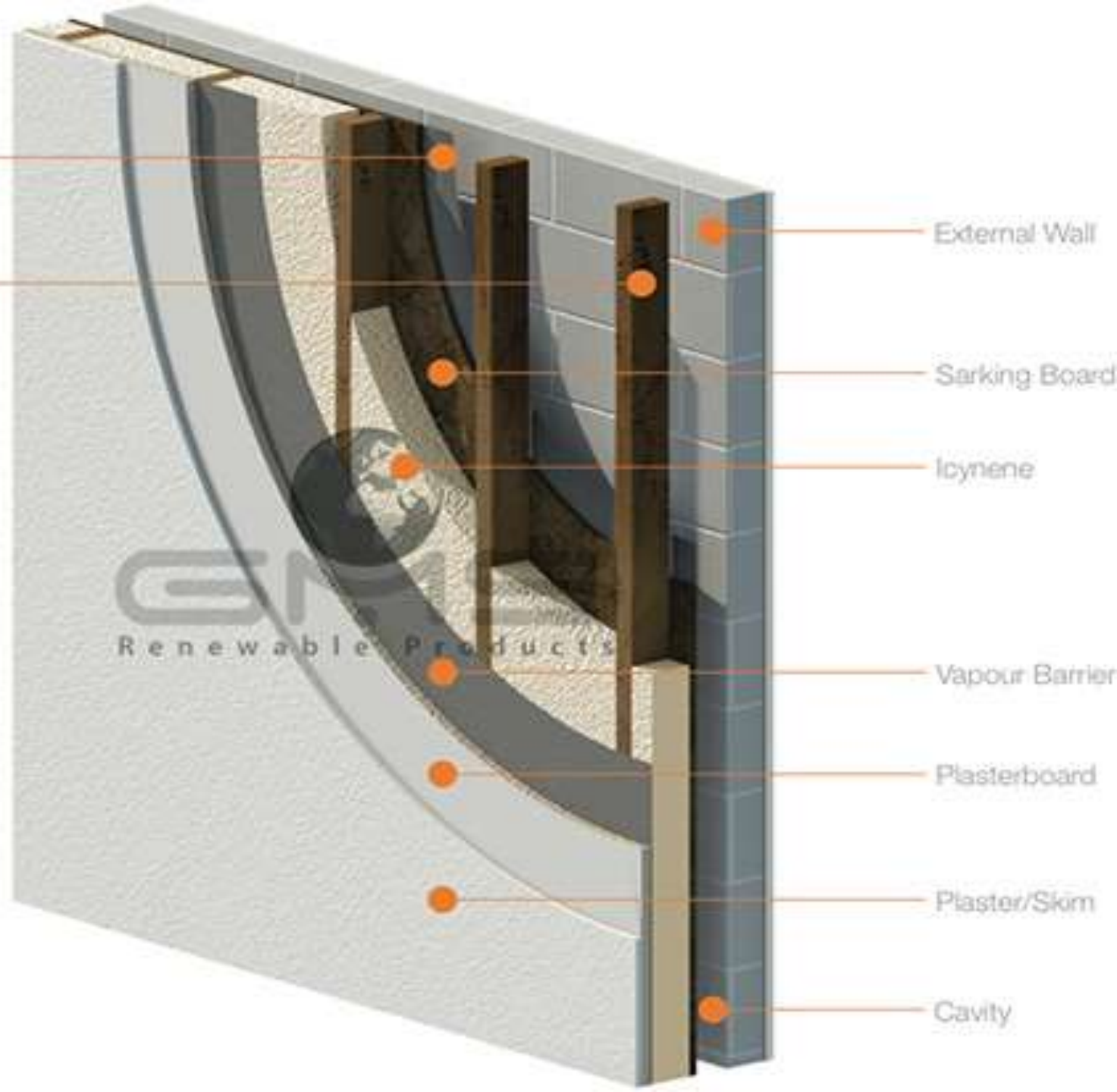
Vapour Barrier

Plasterboard

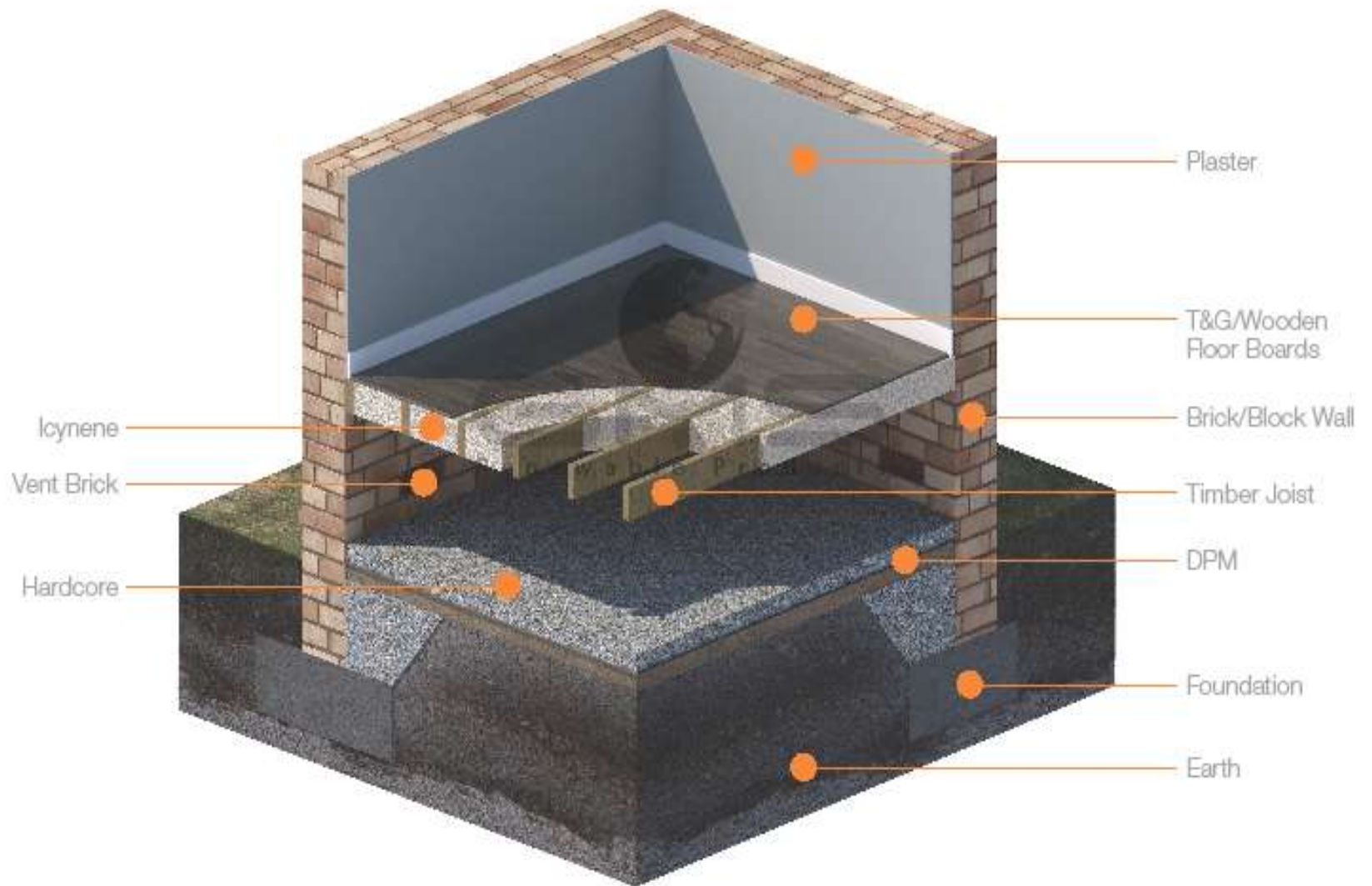
Plaster/Skim

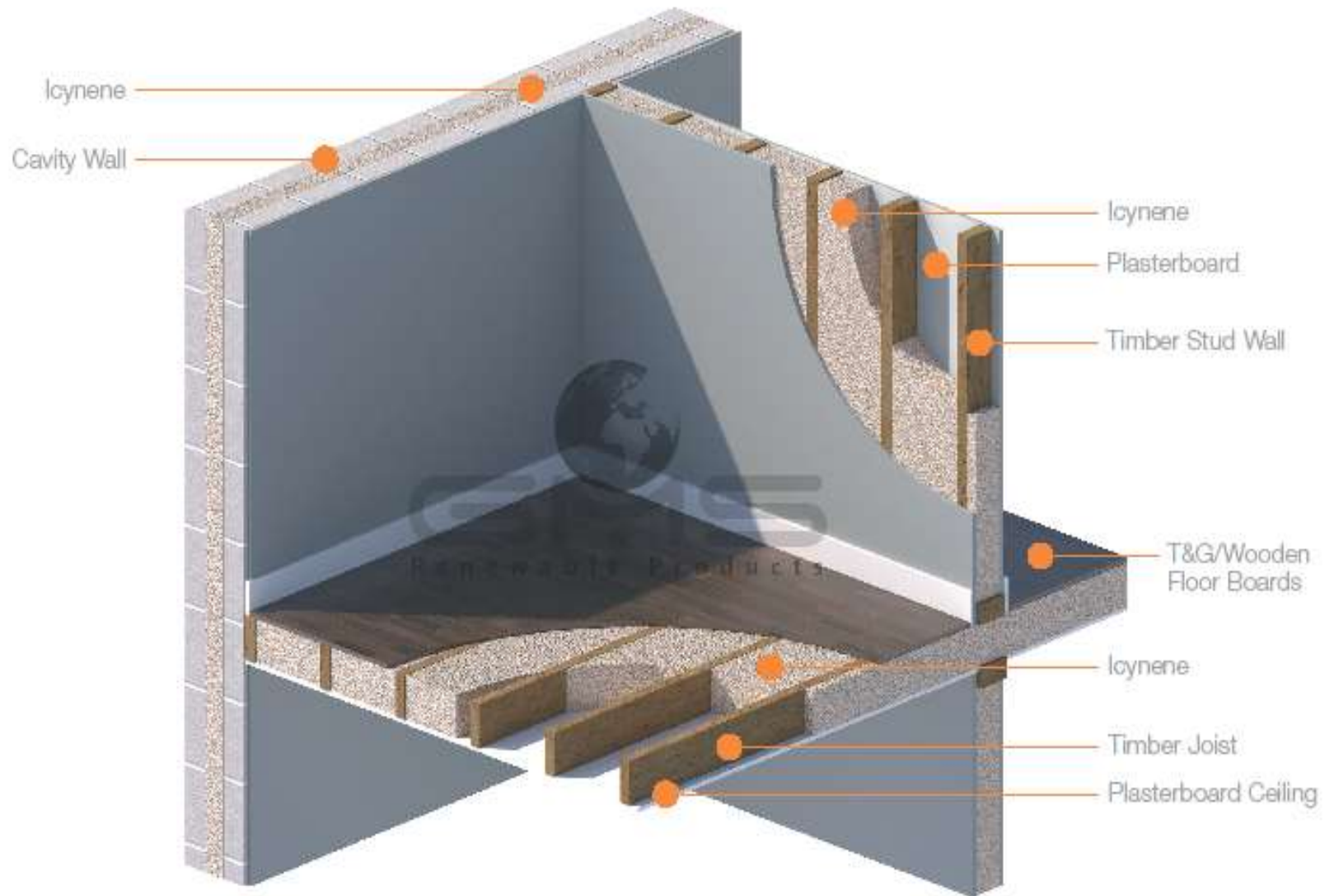
Cavity

Renewable Products

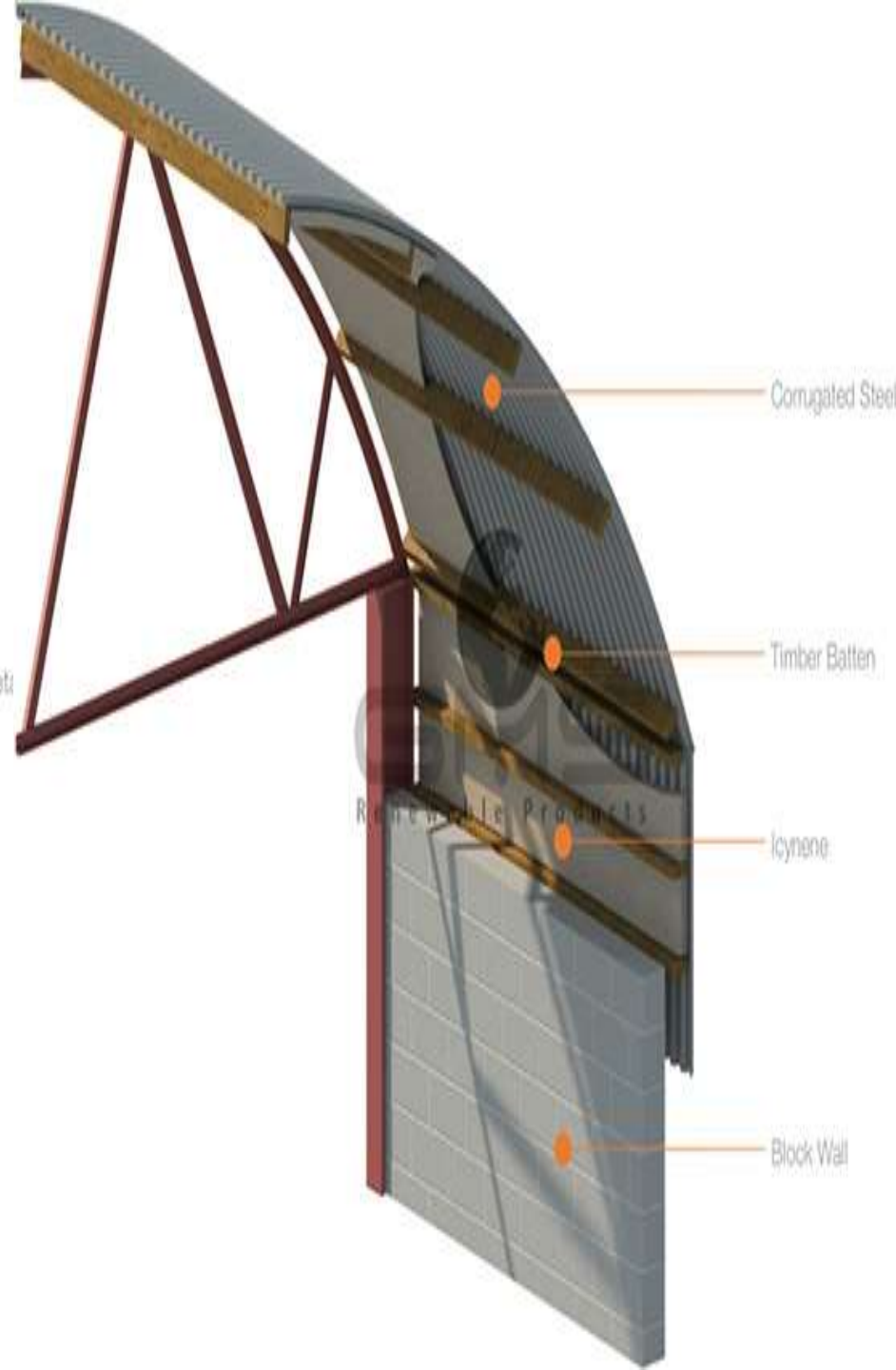




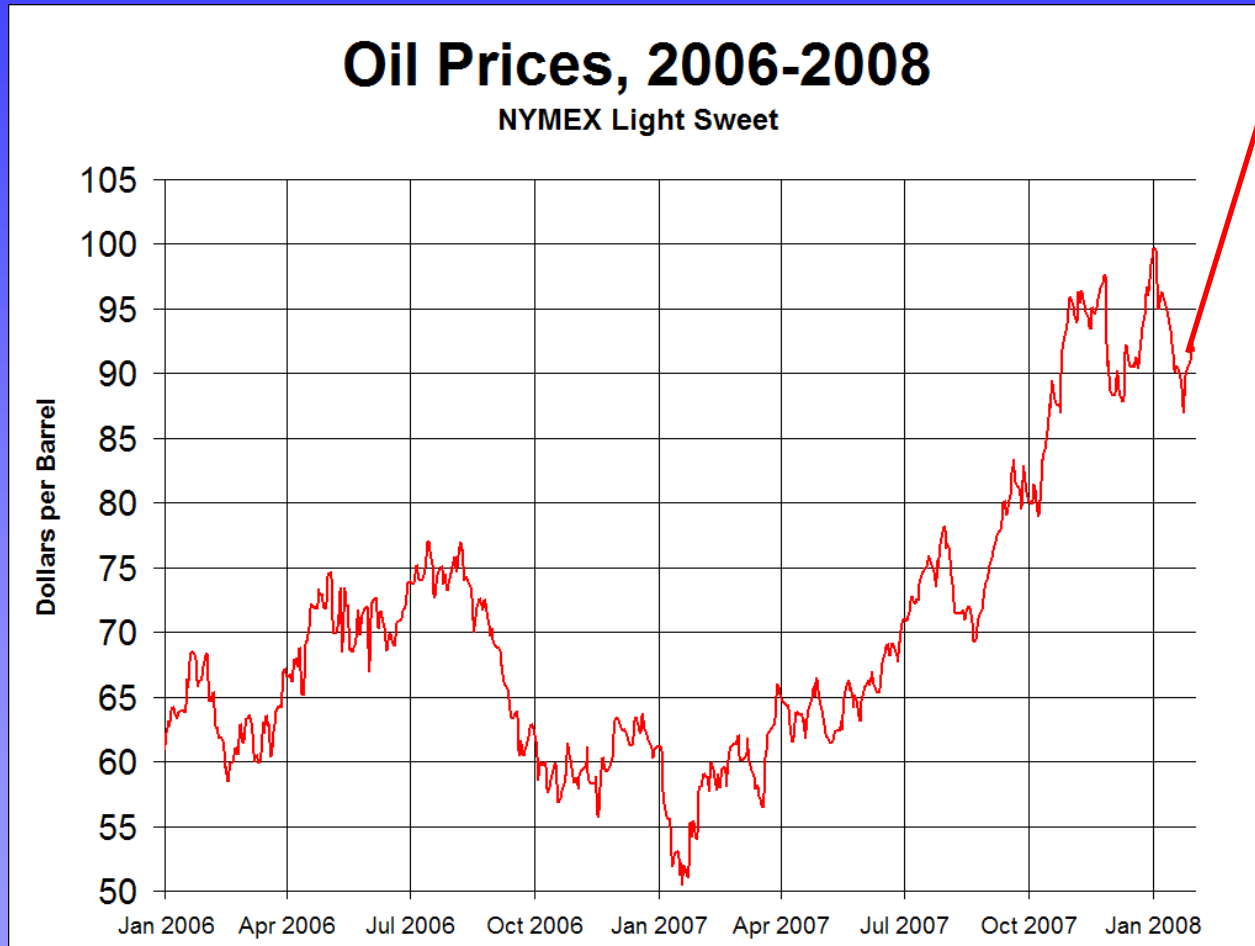






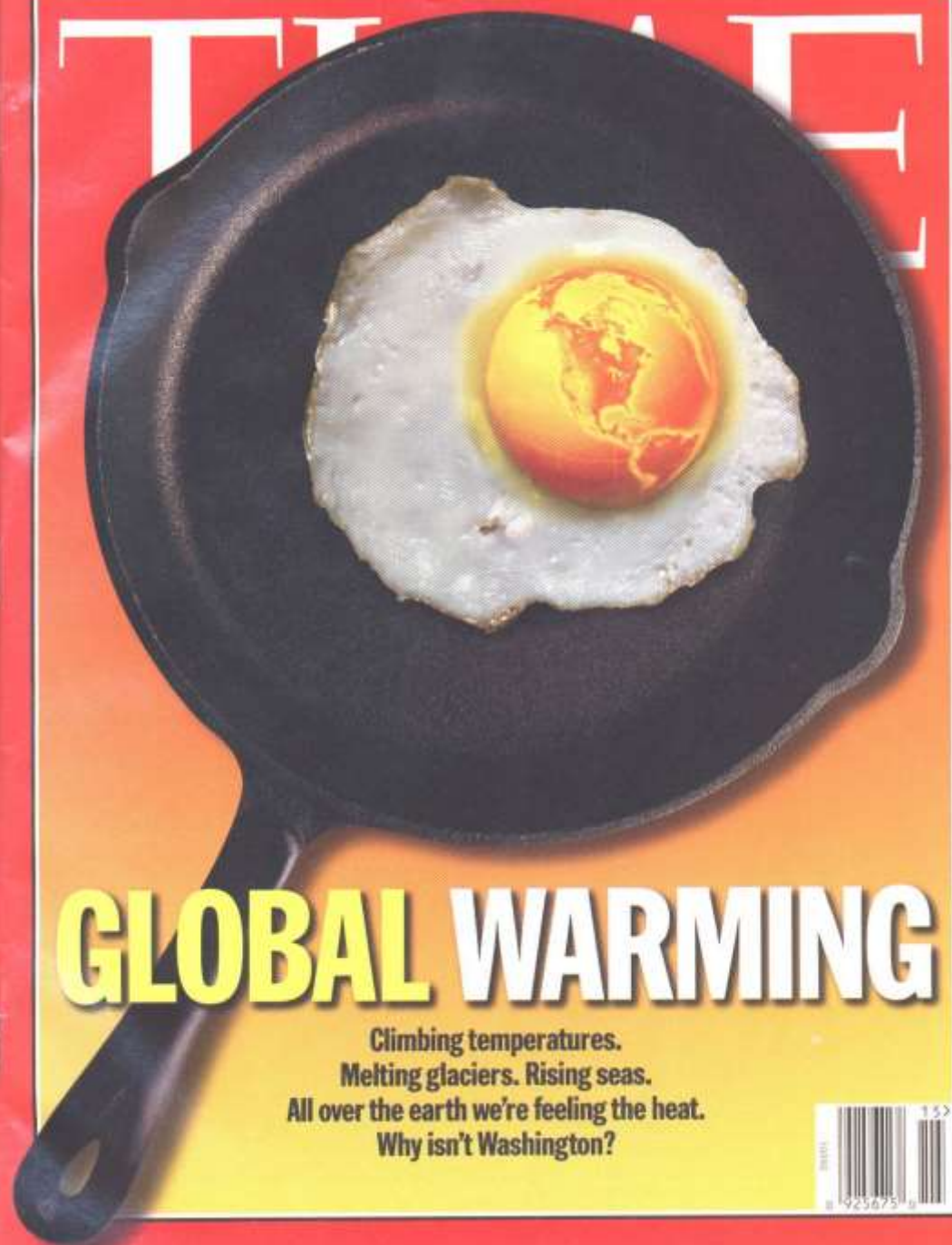


# Fuel Prices



May 2008  
> \$130

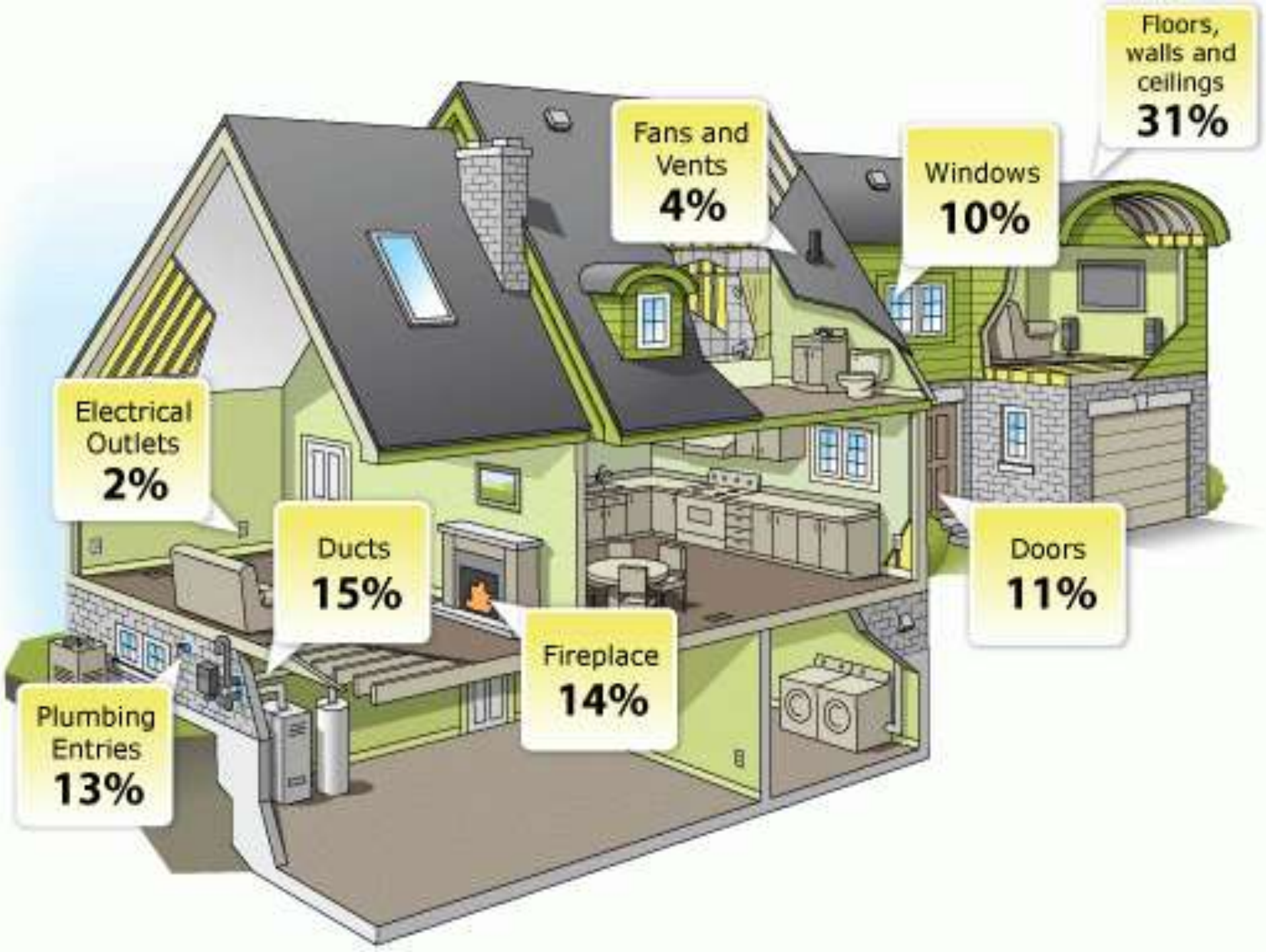




# GLOBAL WARMING

Climbing temperatures.  
Melting glaciers. Rising seas.  
All over the earth we're feeling the heat.  
Why isn't Washington?







# Types of Energy Transfer

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»Conduction

»Convection

»Radiation

»Mass Transfer

Note that U or Lambda value only measures conduction

# Convection? Mass Transfer?

## Convection

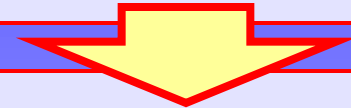
Air movement  
transporting heat and  
moisture

Air Leakage:

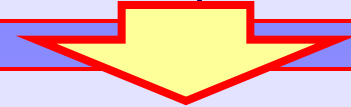
**50 %**

## Mass Transfer

Warm air can carry a great  
amount of water in the form of  
water vapor / humidity



And water vapor can store  
4000 times the heat energy of  
dry air.

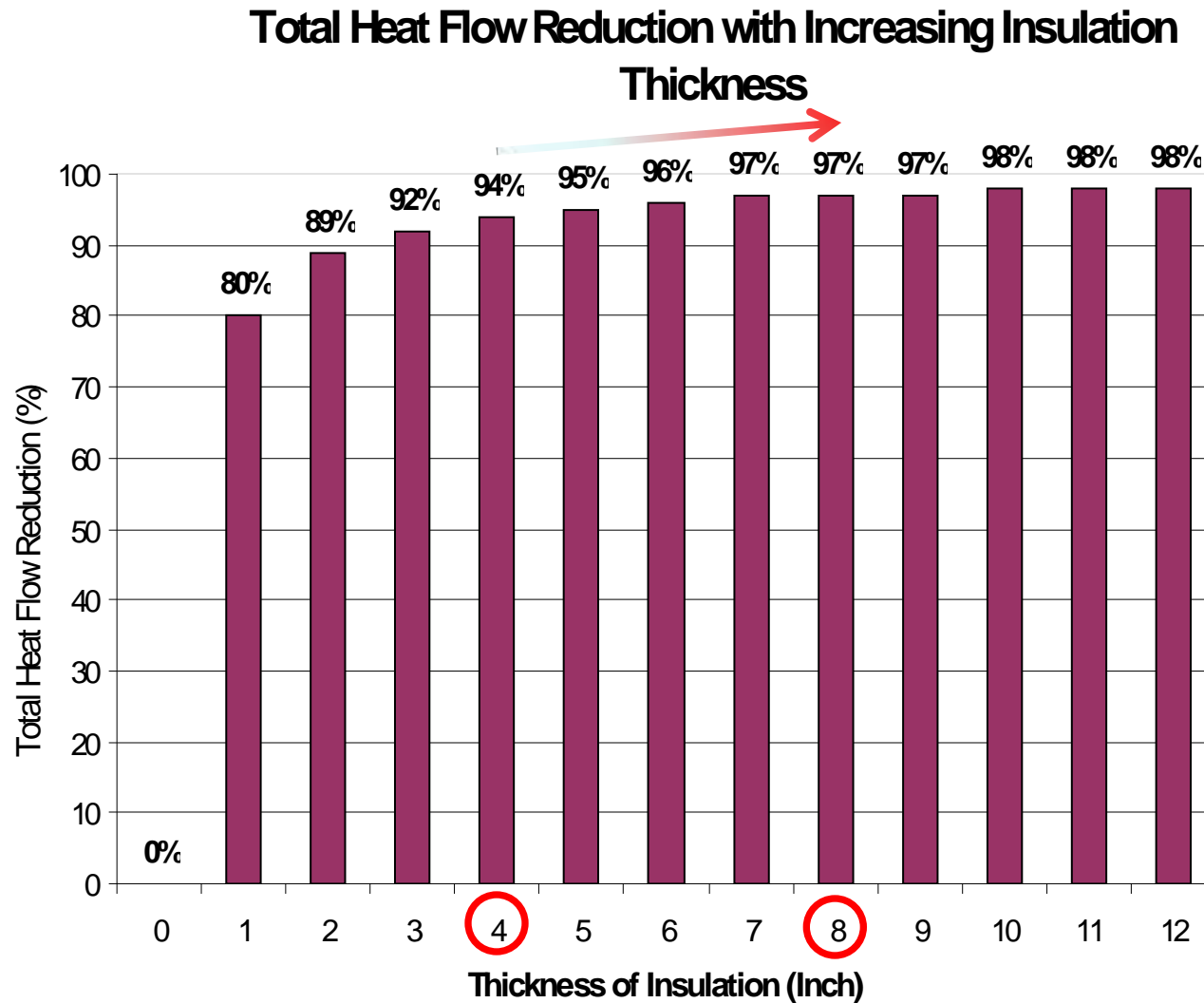


With the combination of these  
two, air leakage contributes up  
to **50%** or more of the heating  
& cooling loads in insulated  
buildings.

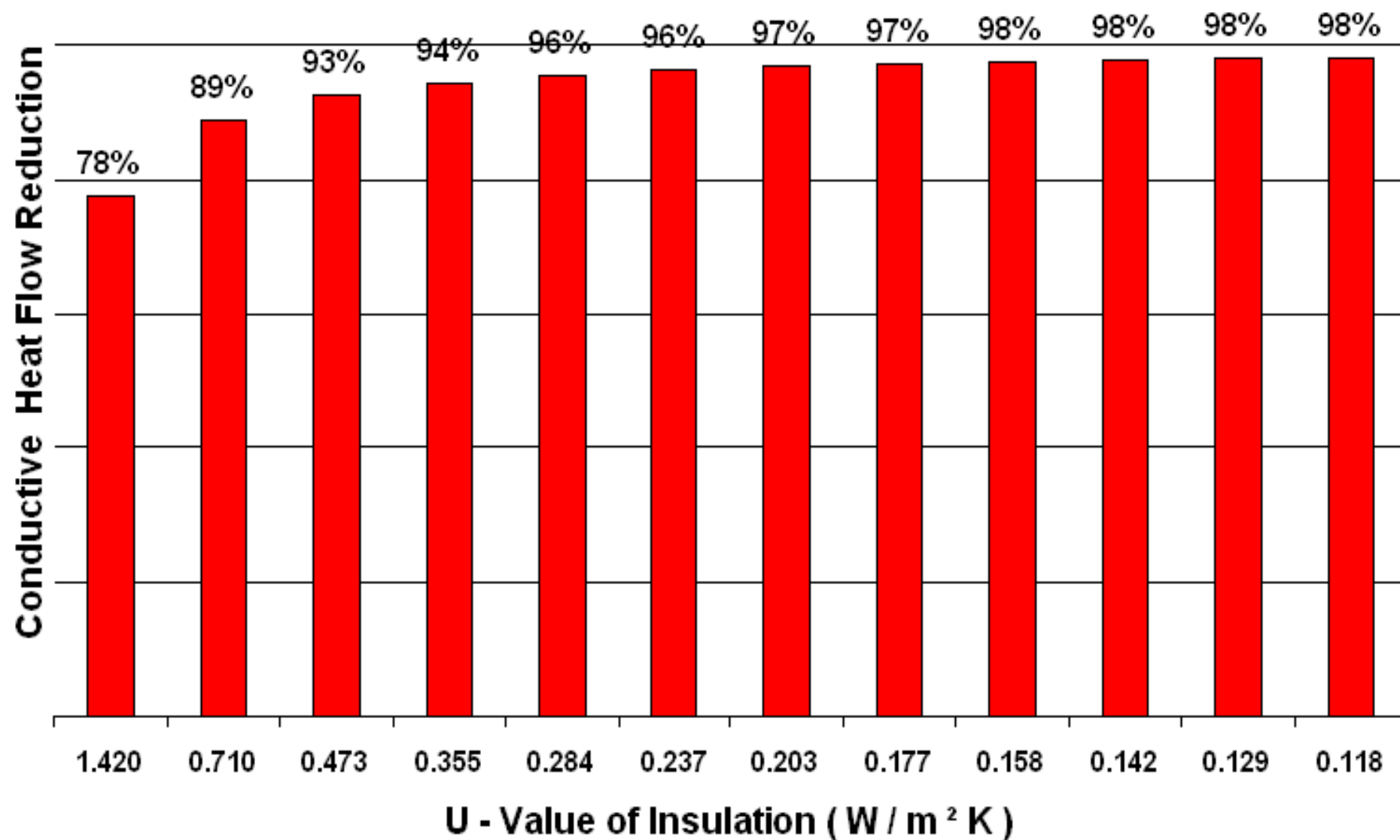




# The Myth of insulation depth and U value



## Conductive Heat Flow Reduction with Decreasing U - value





# The Problem with U Value

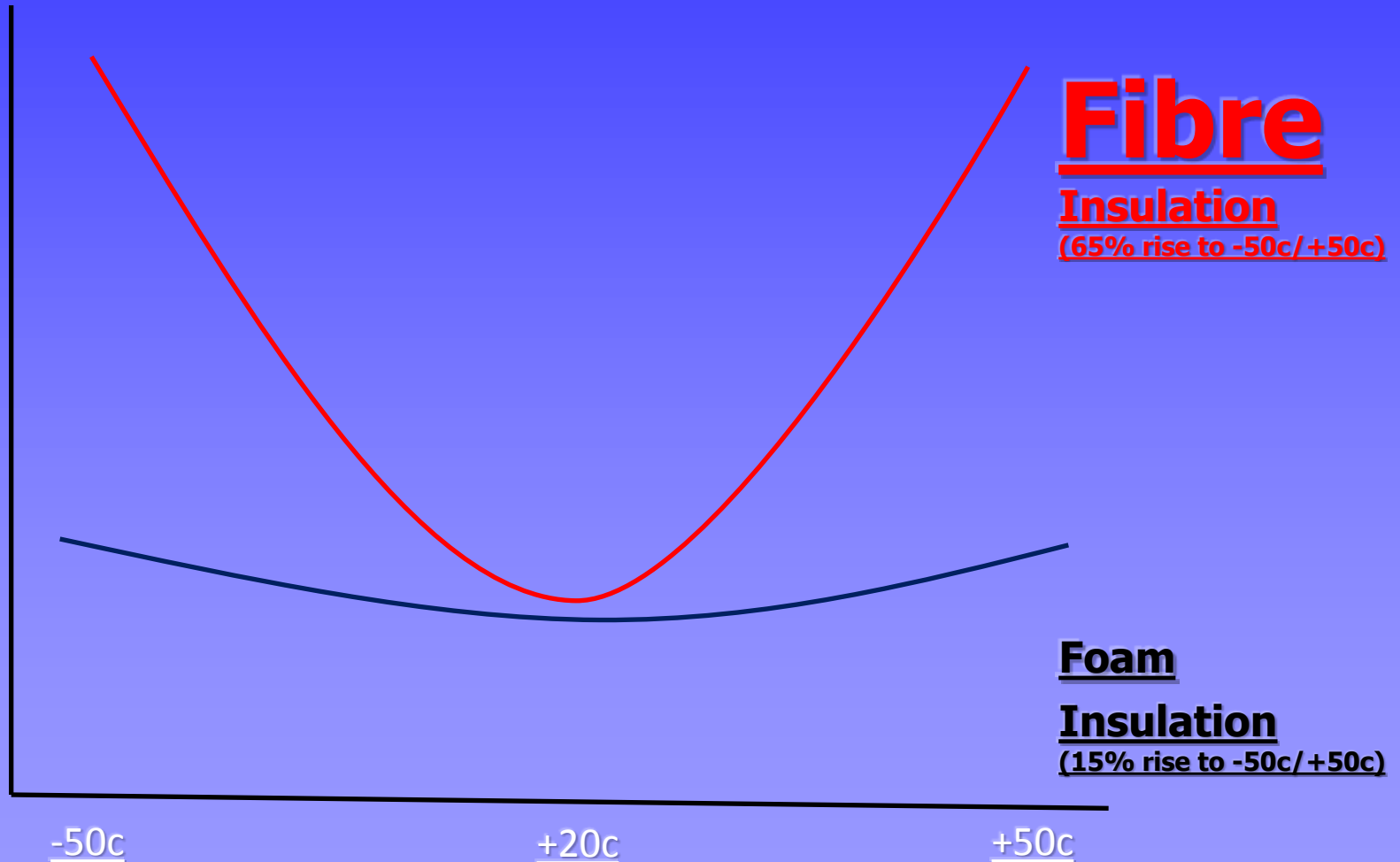
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- Decreasing U-Value by increasing wall thickness greater than 125 mm
  - Will not substantially save energy
  - Is not cost effective
  - Does not address air leakage or condensation issues
  - Energy Calcs are U driven and do not give adequate credit for Air Barrier – makes it hard to introduce innovative products to the market

**Controlling Air Leakage is key**

# Insulation Performance Varies with Temperature

Conductive  
&  
Convective  
Heat Flow



Outside Temperature\*

\*Assuming a constant 20c interior temperature



# Buildings will get wet

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- Many buildings at some time will experience water in the interior in some fashion eg. roof leaks, condensation.
- The idea that a building can be totally waterproof is virtually impossible to achieve.
- Better to design using materials which, if they do become wet, can dry and resume their function without slumping or distorting.

# Moisture Accumulation

- The most common cause of building problems is:

## **Moisture Accumulation**

### Moisture Accumulation

Condensation

Leaks

Wet Building Materials

### How It Affects Us?

Structural Damage

Damage to Interior Finishes

Mould and Mildew

Poor Indoor Air Quality

Unhealthy Buildings

Legal Concerns



# Moisture Control

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How do buildings get wet?

1. Liquid Water Intrusion

- Foundation, Walls, and Roof Leaks
- Improper window detailing
- Plumbing Leaks
- Capillary Action (Rising Damp)

2. Moisture Vapour Condensation

- Air Transport
- Vapour Diffusion

# Moisture Transport via Vapour Diffusion

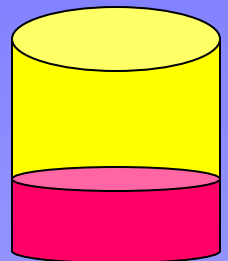
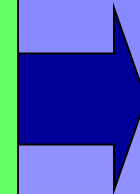
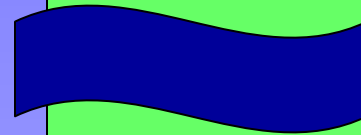
## Diffusion

- Migration of moisture by means of vapour pressure differential
- Occurs in either direction based on climate conditions and interior levels of humidity.

**Vapour Diffusion**

4 X 8 sheet of  
Gypsum Board

70°F / 40 % RH

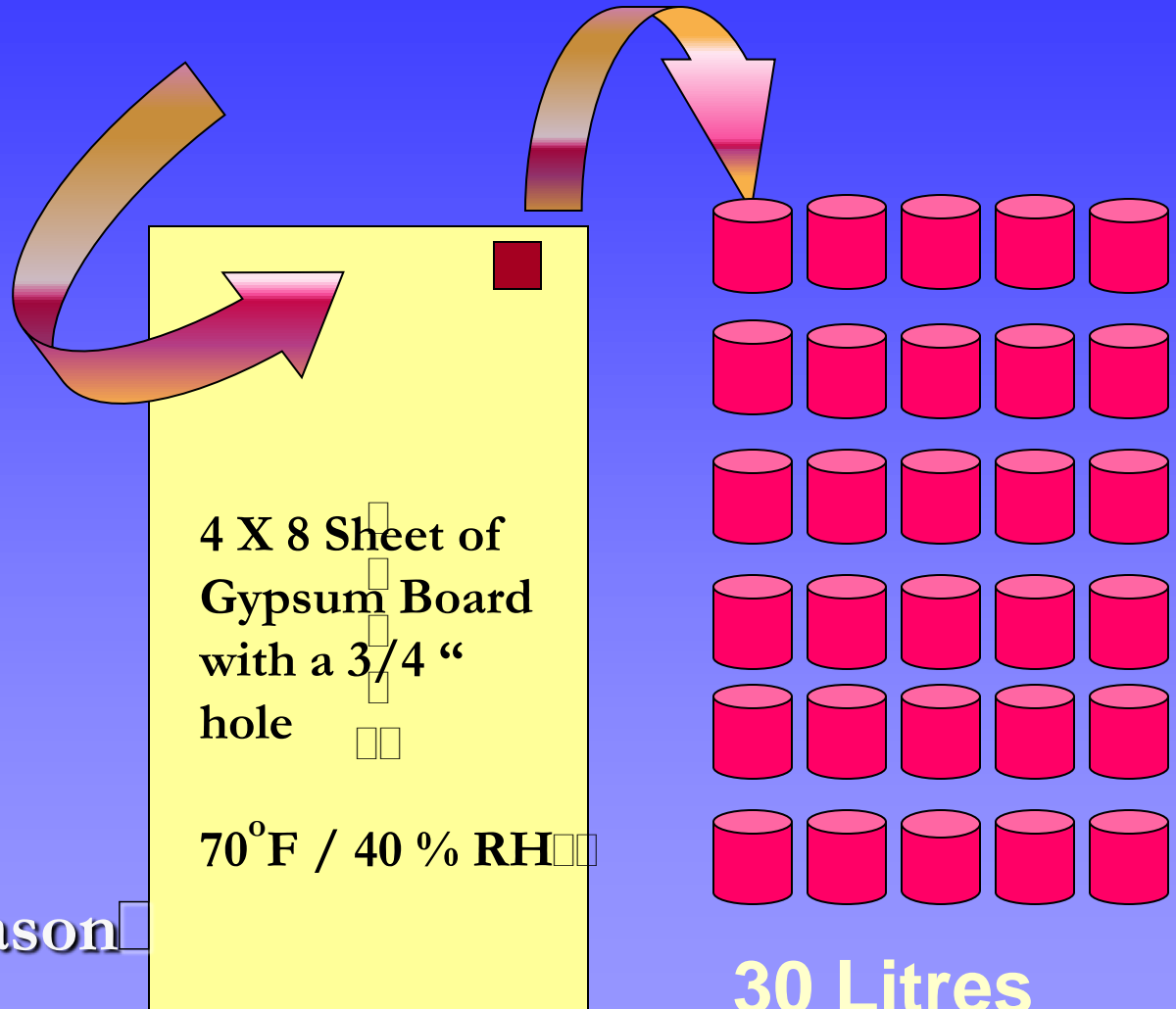


One Heating Season

1/3 Litre  
of Water

# Moisture Transport via Air Leakage

**AIR LEAKAGE**



One Heating Season


**30 Litres  
of Water**











Condensation & mold  
Under a steel roof



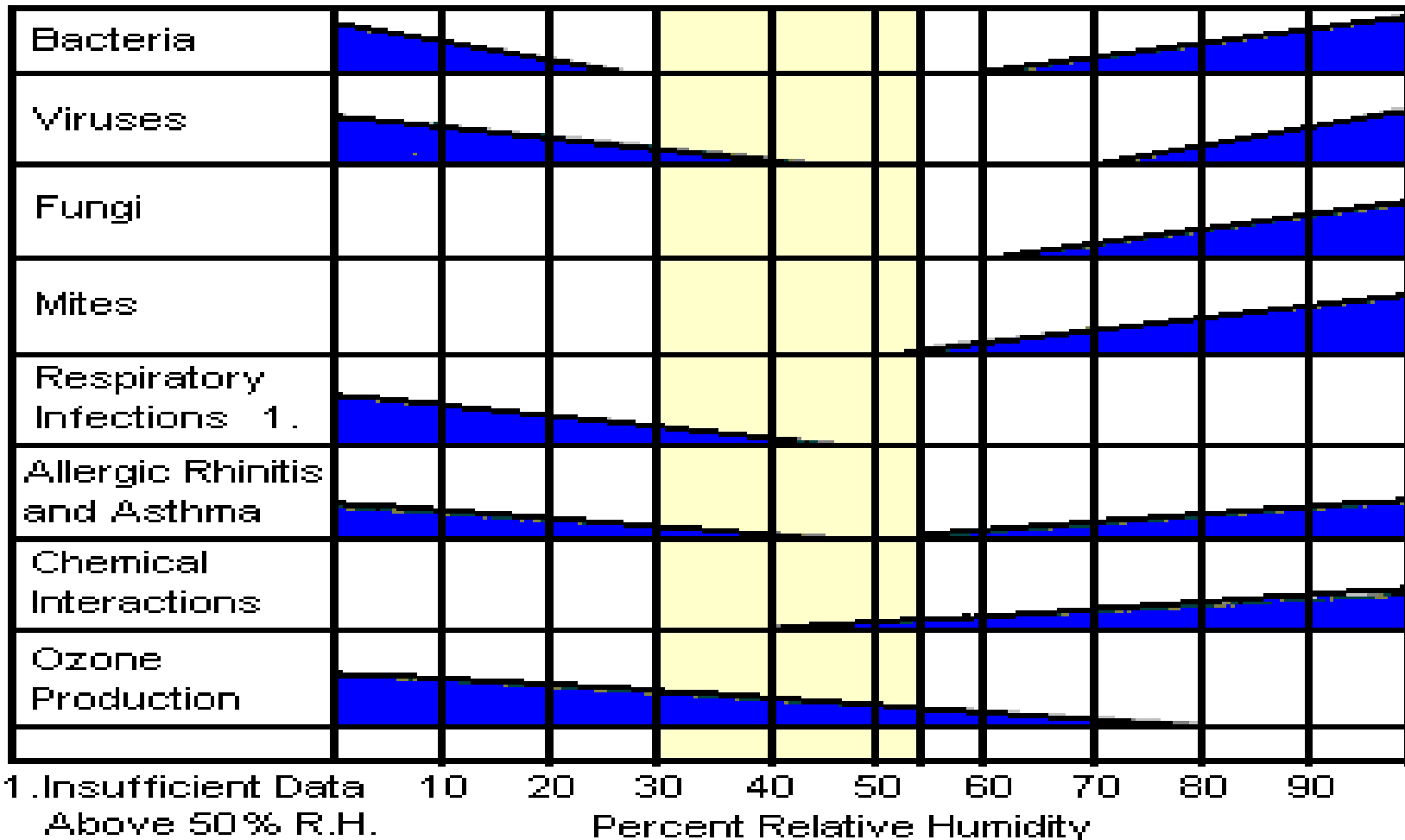




# Health & Humidity

Decrease in bar width  
indicates decrease in effect

Optimum  
Zone





# Soft Foam Insulation - a new Insulation Category

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## Benefits:

- Air Leakage control
- Draught free environment
- Helps control condensation / mould
- Significant reduction in energy usage
- Sound Attenuation

# This Concludes our Presentation

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- Thank you for your attention
- For further information contact
- **[www.icynene.ie](http://www.icynene.ie)**
- **[info@icynene.ie](mailto:info@icynene.ie)**
- **Gerry Sheridan 087 2394962**