



# High Time to Train the Trades



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Passive House Academy & MosArt





**O'Leary family home, 'Out of the Blue', Wicklow**

# Nuts About Passive House!

- § Passive House Dweller (Since 2004)
- § PH Trainers (500+ graduates in Ireland and US)
- § PH Building Certifiers (60+ US projects alone)
- § PH Consultants (US Army)
- § PH Marketers (6 edu-videos, 60,000 views)
- § PH Researchers (EuroPHit, ZECOS)
- § PH Policy Advisors (Government & State Authorities)
- § PH Business Development (Export & innovation)





## TOWARDS 2020 – NEARLY ZERO-ENERGY BUILDINGS

Context – why this Core Theme?



Photo of a prefabricated zero-heating energy house in Germany

[Directive 2010/31/EU](#) (EPBD recast) Article 9 requires that "Member States shall ensure that by 31 December 2020 all new buildings are nearly zero-energy buildings; and after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings". Member States shall furthermore "draw up national plans for increasing the number of nearly zero-energy buildings" and "following the leading example of the public sector, develop policies and take measures such as the setting of targets in order to stimulate the transformation of buildings that are refurbished into nearly zero-energy buildings".

# NZEB for Public Buildings In 5 Years

# What are ‘Nearly’ Zero Energy Buildings



## Towards nearly zero-energy buildings

Definition of common principles under the EPBD

*Final report – Executive Summary*

n “Buildings with heating & cooling  $< 15 \text{ kWh/m}^2\text{a}$  will almost certainly suffice to be called nearly zero-energy building”



# Brussels Goes Passive from 2015



MDW Architecture



[www.gbpn.org](http://www.gbpn.org)



[www.detail-online.com](http://www.detail-online.com)



Going Passive but within the EPBD –  
that's so clever!





# Time to Get Busi Training the Trades



The screenshot shows the top section of the 'BUILD UP SKILLS' website. The header features the logo on the left, the title 'BUILD UP SKILLS' in large orange letters with 'ENERGY TRAINING FOR BUILDERS' below it, and the European Union flag on the right. A navigation bar contains links for Home, National projects, EU Activities, Calendar, Resources, and About. Below the header, the main heading 'Energy training for builders' is displayed. The central image shows three construction professionals in safety gear reviewing plans on a construction site. To the right is a vertical collage of smaller images showing various construction and training activities. An orange text box at the bottom of the main image contains a statement about national priority setting, with a 'Read more' link.

**BUILD UP SKILLS**  
ENERGY TRAINING FOR BUILDERS

Home | National projects | EU Activities | Calendar | Resources | About

## Energy training for builders

Contribute to national priority setting: a key achievement of BUILD UP Skills will be endorsed national roadmaps pinpointing to the most important changes and concrete measures needed in the continuous education system of the building sector.

[Read more](#)

## Build Up Skills UK – the 2020 Skills Roadmap

Build Up Skills UK (BUSUK) is a landmark piece of training and skills research to map the areas of growth and investment for the entire UK construction and energy efficiency workforce in the built environment.



Status Quo Report



Roadmap Report



Endorsement Events



**Table 2: Estimated numbers in the blue collar workforce requiring training to help meet 2020 energy efficiency targets**

Occupation	Average score for new technology skills and knowledge	2020 Deficit	2012 Workforce	Estimate of training required
Construction and building trades nec	5.6	-2.0		
Glaziers, window fabricators and fitters	5.7			
Plumbers; heating and ventilation engineers				
Construction operatives				
Roofers, roof tilers				18000
Bricklayers				2000
		-1.4	278662	39000
	7.2	-1.3	218302	28000
	7.3	-1.2	41246	5000
	7.4	-1.1	58348	6500
Electricians	7.9	-0.6	118708	7200
Ironworkers, scaffolders, staggers and riggers	8.2	-0.3	31186	1000
Steel erectors	8.4	-0.1	12072	120

**0.25 million UK blue collar workers need training in energy efficiency**

<http://www.buildupskillsuk.org/>

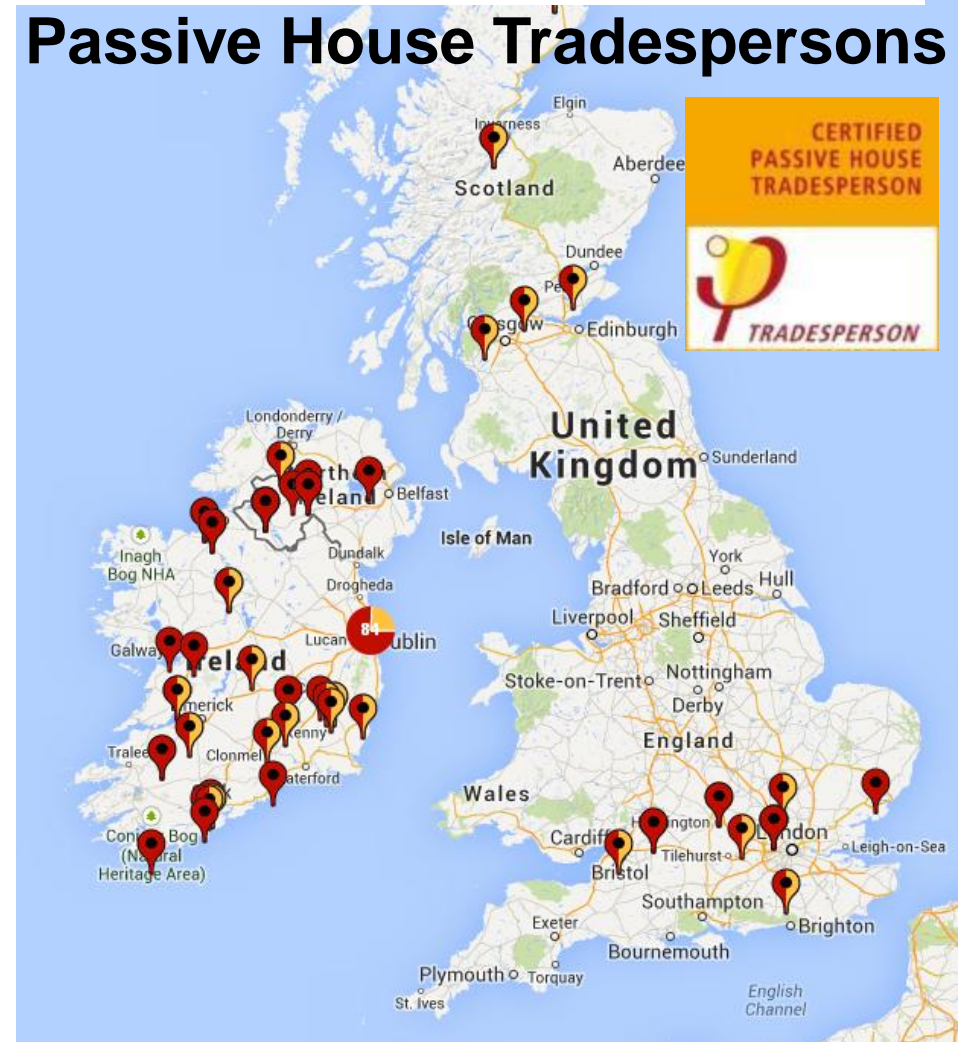
# 249,982 workers still to be trained

## Passive House Designers



Ireland: 264, UK = 364

## Passive House Tradespersons



Ireland: 126, UK = 18

***“The PH airtightness level is too difficult”***



***Saskatchewan  
Conservation House  
1977:  $n_{50} = 0.8 \text{ h}^{-1}$***



***Darmstadt  
Passive House  
1991:  $n_{50} = 0.22 \text{ h}^{-1}$***



# 120 Year old Brooklyn Brownstone EnerPHit



**2012**  
 $n_{50} = 0.38 \text{ h}^{-1}$

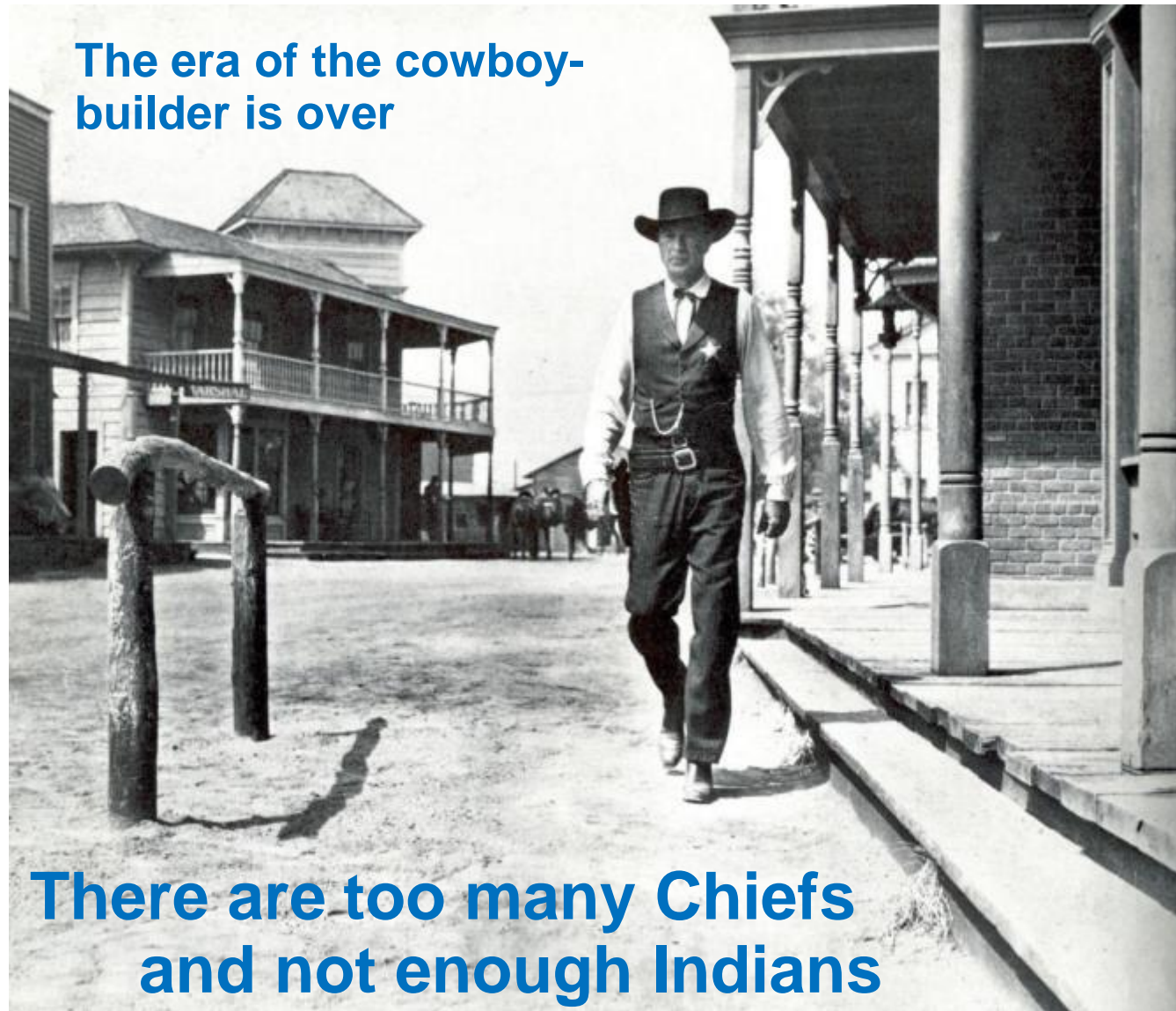
Thermographic image – Sam McAfee, SG.Build

# Weapons of Mass Destruction



Passivhaus Standard - as much hands as head  
- training for **'thinking' fingers**

# Passive House Learning + the Wild West

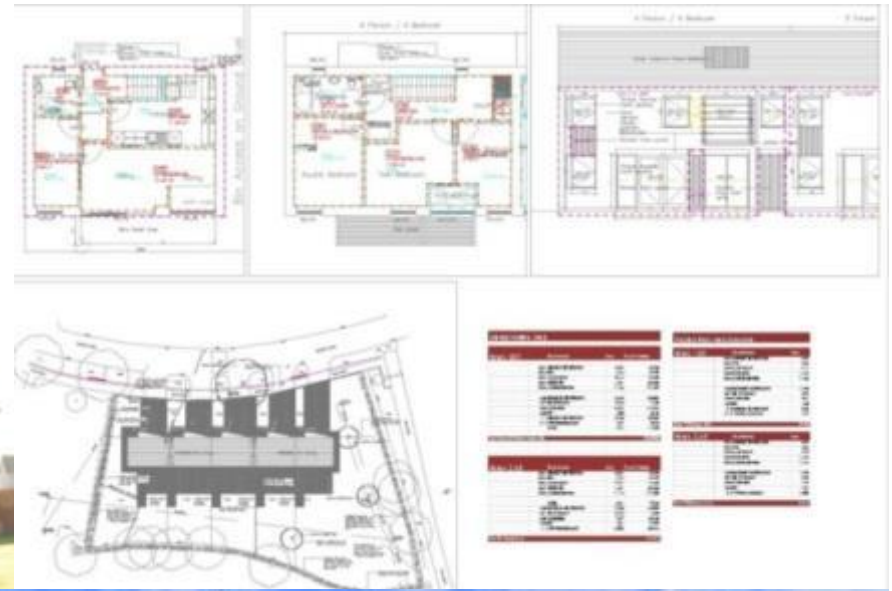




# Passive House: old and new

## New build

Social housing,  
Dungannon  
Kennedy Fitzgerald  
Architects



## Retrofit

Social housing, Newry for NIHE  
MosArt Architects



# Two Fundamental Categories:

Building Envelope + Building Services



PHA Passive House Tradesperson Lab in the Bronx, NYC, with AEA





# *Death by PowerPoint ...* **Not Acceptable for the Trades**





# Learning by Doing!



Changing the construction culture...*train for 'thinking fingers'!*

Passive House Academy approach is to include practical content



# CPHT

- Building Envelope
- Building Services

Theory based training and exam

Practical training and exam

Exams set by the PassivHaus Institut  
x 4 per year

Global Accreditation

FÁS and PHA provide the  
most complete training available



# Building Envelope Theory

- Passive House Principles
  - Insulation + U-Values
  - Thermal Bridging
  - Airtightness
  - Passive House Windows & Doors
  - MVHR
- 
- Energy requirements in a Passive House
  - Introduction to PHPP
  - Design exercises + detailing
  - Passive House Certification
  - Economics





# Building Services Theory

- Passive House Principles
  - Introduction to PHPP
  - Ventilation
  - Airtightness
  - Air Change and Ventilation Rates
  - MVHR
  - Ventilation Ducting
  - Noise Protection
- 
- Heating in a Passive House
  - Passive House Energy requirements
  - Balancing + Commissioning
  - QA + Certification
  - Economics



# Building Envelope – demonstration models

