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High Performance Building Alliance
& NZEB 29th November 2022



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Bord Oideachais agus Oiliúna
Phort Láirge agus Loch Garman
Waterford and Wexford
Education and Training Board



HPBA
HIGH PERFORMANCE
BUILDING ALLIANCE

 **Wexford**
County Council



Wexford County Development Plan 2022 – 2028

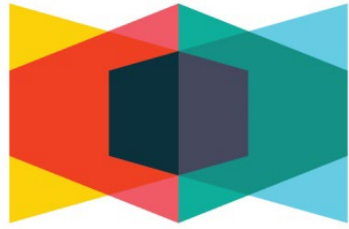
Sets out the six year framework for the proper planning and sustainable development of the County. It sets out the strategic spatial vision and future direction.

Leading a county which is resilient, progressive & dynamic

Wexford: A vibrant place where people can live, visit & work in a sustainable, innovative & inclusive community



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NEARLY ZERO ENERGY BUILDINGS (NZEB)

“Nearly zero-energy building means a building that has a very high energy performance....

The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby”

(Directive of The European Parliament and of the Council on the Energy Performance of Buildings (Recast):

EU, 19th May, 2010.)

		Organisation	Consultation
Organisation		Irish Manufacturing Research	National
Government Departments		Education	
Dept. Housing Local Government & Heritage (DHLGH)	National	South East Technological University	Regional
Dept. of Environment Communications & Climate (DECC)	National	SOLAS	National
Dept. of Further & Higher Education, Research, Innovation & Science (DFHERIS)	Awaiting Nominee	Waterford & Wexford Education & Training Board	Local
		National Bodies & Industry	
Local Government		Mosart Architects & Pinergy	Local
Wexford County Council	Local	Irish Congress Trade Unions	National
NGO's		Construction Industry Fed.	National & Regional
Irish Green Building Council	National	National Standards Irl	National

Objectives

Model of Best Practice

To establish Ireland as a world class leader in high performance buildings including Nearly Zero Energy Buildings (NZEB).

Training

To help up-skill the construction industry and related services in delivering high performance buildings.

Delivery of Targets

Support the fast track delivery of new high performance buildings and the deep retrofit of existing buildings.

Research

To continue to advance innovative building practices to achieve greater sustainability and energy efficiency in collaboration with practitioners and third level education providers.

International Advisory & Dissemination Role

To explore international opportunities to facilitate the development of exemplar high performance building processes. UNECE High Performance Building Initiative

Objectives

Social Inclusion

Help address fuel poverty and promote a healthy indoor environment.

Employment

Explore additional employment opportunities in the construction and related services sector.

Climate Action

Support the transition from harmful carbon based fuels to sustainable solutions to help combat climate change.

Policy Guidance

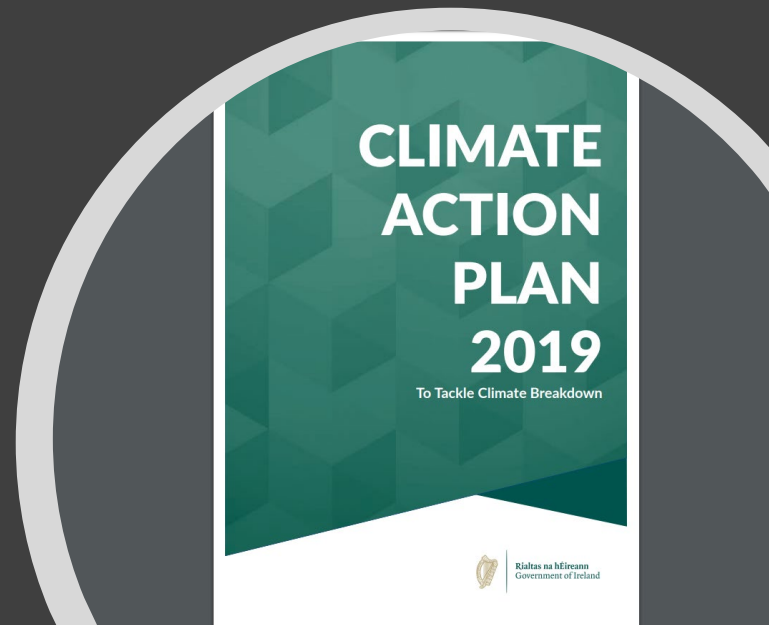
To advise stakeholders on developing more high performance buildings.

Information

To promote awareness, education, training and best practice in high performance buildings.

Key International Agreements:

- **SUSTAINABLE DEVELOPMENT GOALS**
- **United Nations Sustainable Energy for All programme:** Launched in 2011.
- The **Geneva United Nations Charter on Sustainable Housing** is a non-legally binding document that aims to support member States as they seek to ensure access to decent, adequate, affordable and healthy housing for all. It was endorsed by the United Nations Economic Commission for Europe in 2015. COP 26 Climate Summit in Glasgow .
- Legally binding EU Targets: Member States to reduce greenhouse gas emissions by 20% by 2020 of the historic energy use during the period 2000-2005. **Ireland's National Energy Efficiency Action Plans (NEEAP)** details the policies and measures for Ireland.
- **Paris Climate Agreement:** Global framework to avoid dangerous climate change by limiting global warming to well below 2°C. The EU formally ratified the agreement on 5 October 2016.
- **United Nations Framework Guidelines for Energy Efficiency Standards in Buildings:** Adopted Sept. 2017. This framework ensures energy standards for buildings will support holistically designed and operated high performance buildings as part of an integrated sustainable energy system.
- European Commission published additional guidelines on the **NZEB standard** - July 2016.
- **Future Jobs Ireland 2019** has 5 pillars including the transition to a low carbon economy.
- **Climate Change Policy, 2019** reflects Ireland's commitment to achieving the 2030 Sustainable Development Goals (SDGs) agreed by the United Nations in 2015.
- Climate Action plan sets target of carbon neutral by 2050
- COP 26 Glasgow 2022 & more recently COP 27



Climate Action Regional Offices (CARO)

- 1. Leadership & Governance
- 2. Carbon Emissions & Energy Efficiencies
- 3. Adaptation
- 4. Mobilising Community Action
- 5. Mobilising Enterprise
- 6. A Just Transition



Figure 1: Technical reports from the seven workstreams of the National Heat Study

Irish Buildings Regulatory Framework

In 2019, legislation amendments to Part L of the Building Regulations, giving effect to NZEB Regulations and Major Renovation Regulations – National Approach to conservation of fuel and energy.

June 2022 changes to Part L aim to reduce carbon emissions by 31%

Also signed into law amendments to Part F of the Building Regulations, which relate to ventilation.

- The NZEB standard applied to all new buildings occupied after the 31st December 2020.
- For Public Sector bodies, the standard applied to all new buildings owned and occupied by the 31st December 2018.

For all new builds, NZEB is equivalent to a 25% improvement in energy performance on the 2011 Building Regulations.





“With Residential Energy accounting for 23% of Ireland’s total energy consumption housing and its sustainability is imperative for Ireland to transition to a low carbon economy improving quality of life.”

Minister Darragh O’Brien TD launches HPBA at government Buildings for COP 26

Synopsis of Work Completed to Date



Step	Action
1	First NZEB Local Authority housing scheme in Ireland: Pilot scheme - WCC houses completed and affordable. Part of a third level research and monitoring programme with Ulster University.
2	Wexford County Council and MosArt hosted the first Irish conference in NZEB buildings in Enniscorthy, Co. Wexford opened by Minister for Housing.
3	First Local Authority to train staff in NZEB principles with WWETB and national pioneers and innovators in this area through embracing new technologies, meeting the building code and addressing fuel poverty.
4	A delegation of world leaders in sustainable buildings and energy, visited Wexford to discuss plans to locate Ireland's first NZEB training centre in Enniscorthy, Co. Wexford.
5	Minister for Housing, announced County Wexford has been selected as Ireland's representative for consideration by the UNECE as a Centre of Excellence in High Performance Buildings initiative. Letter of intention signed
6	On-going hosting of local authorities, international agencies, NGO's and Government Departments, to share best practice in the training, research and dissemination of NZEB buildings.
7	Up-skilling of construction sector, Local Authorities and professionals in partnership with WWETB.
8	Co-ordinating the development of the designated UNECE Centre of Excellence in High Performance



Synopsis of Work Completed to Date

Step

- 1 WWETB contract MosArt and deliver first NZEB training centre with 1,200 trained last year. WCC first Local Authority to train staff in NZEB principles. WWETB training centre model Enniscorthy, Wexford to be replicated in 2021 in 4 other regional centres funded by SOLAS. HPBA work of stakeholders as the national pioneers and innovators in this area through embracing new technologies, meeting the building code and addressing fuel poverty.
- 2 Leading out on Green Procurement to ensure construction sector staff trained in NZEB skills PUSH FACTOR for adoption of Green Skills
- 3 Successful funding programme to Irish Government by Department Housing , Heritage & Local Government for the HPBA as lead NGO in Ireland to promote high performance at new building Enniscorthy Technology Park. Complete Branding & decarbonisation Zone Enniscorthy Town
- 4 R& D opportunities with new university campus for the South East in Green Skills. South East Technological University.

Irish Government Targets (National Climate Action Plan 2019)

- The National Climate Action Plan 2019, recognises the strategic alliance that Wexford partners have secured with collaborating across five Government Departments.
- **Action 50** in the Climate Action Plan deals with upskilling of contractors in deep retrofitting and NZEB.
- The intention to develop a centre of excellence in high performance buildings is highlighted. These incorporates three pillars: To provide high performance energy buildings; training; and research / dissemination.
- Position the HPBA as a strategic leader in National Policy and Globally through UNECE HPBI

Building the Supply Chain

Action 50: Skill-up current contractors/other industry players in deep retrofit, NZEB and new technology installations			
Steps Necessary for Delivery	Timeline by Quarter	Lead	Other Key Stakeholders
Through engagement with the Regional Skills Fora, the identified skill needs for NZEB, deep retrofit, heat pumps and new technology installations along with other identified skills needs in other sectors will be supported across the education and training system, including through relevant apprenticeship programmes	Q2 2019	DES	SOLAS, SEAI, DHPLG, DCCAE
Deliver NZEB training programme for existing construction workers by Waterford and Wexford Education and Training Board	Q4 2019	WWETB	DES, SOLAS
Develop a centre of excellence for High Performing Buildings in WWETB (potentially part of United Nations Economic Commission for Europe initiative). Accredited training programmes developed in this centre to be delivered nationally through the ETB network.	Q4 2019	DCCAE ⁴	DHPLG, DFAT, DES, DBEI, SOLAS, SEAI, Wexford LA, WWETB
Develop Retrofit Standard/Guidance for traditionally built buildings (i.e. generally pre-1940 construction)	2019-2020	DCHG	SEAI, DCCAE, DHPLG
Support relevant professional bodies in the development of training specifications/courses for the design of NZEB and Deep Retrofit buildings	2019-2021	SEAI	DCCAE, DHPLG
Review process to encourage recruitment and retention strategies for BER Assessors	2019	SEAI	DCCAE, DHPLG
Consider the roll out of NZEB and Deep Retrofit contractor courses nationwide (specification developed with WWETB)	2020	DES	SOLAS

Key Targets



Residential sector must reduce from 7 Mt CO₂ eq. in 2018 to between 3.5-4.5 Mt CO₂eq. in 2030.

National Residential Retrofit Plan aims to achieve the equivalent of **500,000 homes retrofitted** to a Building Energy Rating of B2 by end of 2030.

Approximately **36,500 local authority homes will be retrofitted** in the next decade under the Local Authority Retrofit Programme. These homes will be brought to a B2/cost optimal standard with a heat pump.

Building capacity in the market from its current levels to a point where it can deliver approximately 75,000 home renovation projects per year will require the right initiatives to stimulate and support the market to invest and attract new entrants.

Near Zero Energy Building (NZEB) and retrofit training is being delivered across two specialist centres, with three further centres of excellence in development. An NZEB specific train the trainer programme is in place with the first cohort due to graduate in autumn 2021.

1970's Social Housing for Elderly _ Local Authority

Deliver a national deep retrofit programme for existing housing stock:
by 2030



Delivery: Wexford County Council & SE Energy Agency
WEXFORD 2,503 social housing €3.7m
National Number of residential retrofits: 500,000

Measures included

- **EXTERNAL INSULATION -**
Improving U-Value from 1.8 W/m²K to 0.20 W/m²K
- **ATTIC INSULATION -**
Improving U-Value from 0.16 W/m²K to 0.12 W/m²K
- **HEAT PUMP -**
Daikin 4kW Air to Water Heat Pump – Space Heat Efficiency uplift by 530%
- **WATER HEAT EFFICIENCY -**
uplift by 213%
- **PV SOLAR SYSTEM -**
6 No. 285 West facing Panels
- **DEMAND CONTROLLED VENTILATION -**
Humidity & Standard controls
- **WINDOW & DOOR UPGRADE -**

Project Results



INCREASED BER

Increased BER rating on 10 Properties to A2 Rating – on 1 Property to A3 Rating – 1 Property to A1 Rating

Cost Per Unit – €25,000.00 – Cost Per Unit After Grant – €12,500.00



50% FUNDING

50% Grant Funding Through SEAI Deep Retrofit Pilot Programme.

Project Costs – Overall costs – €300,000.00 – SEAI Grant Funding at 50% – €150,000.00



INCREASED COMFORT

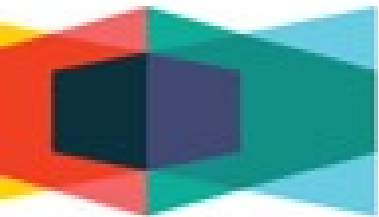
Reduced Costs
Reduced Maintenance costs
Better Air Quality and health benefits
Increased comfort
Increased value

Benefits

- Energy Rating - A3 or Better
- Fuel Poverty – energy saving
- WCC are leaders in sustainable social housing nationally / internationally
UN Centre of Excellence
- Technology Park – first commercial building nationally – Q4 2022
- 70% more energy efficient and emit 70% less CO₂ than 2005 performance
- Typical A-rated 3 bed semi-detached house demonstrates warmer homes and affordability
- University monitoring Wexford NZEB homes to inform best practice



Cherry Orchard – Enniscorthy



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The development of NZEB specifications and courses to address the current and future skill needs of the building sector in Ireland

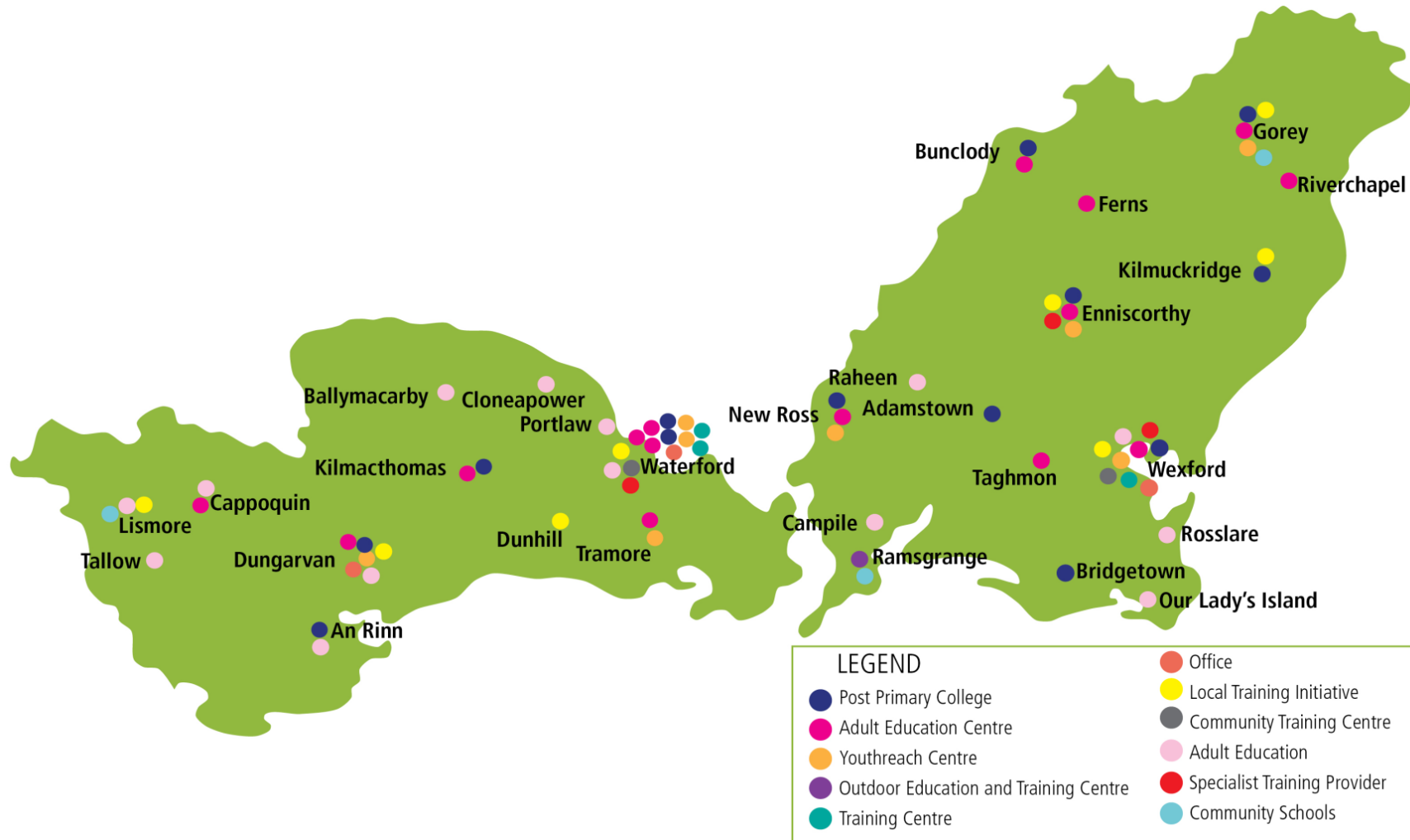
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Waterford Wexford Education and training Board (WWETB)



Membership of the National Advisory Group

Organisation	Representative	Organisation	Representative
Dept Housing, planning & Local Gov	Sean Armstrong	WWETB	John Cassidy
Dept Comm, Climate Action & Environment	Albert Jordan	WWETB	Michael O Brien
SEAI	Orla Coyle	WWETB	Shay Cummins
NSAI	Gary O Sullivan	Gas Networks Ireland	Lorcan Cooke
LIT	Liz O Brien	Wexford CC	Padraig O Gorman
IT Carlow	Pascal Quirke	ICTU	Brian Nolan
WIT	Paul Quirke	IVIA	Pat Lehane
CIF	Simon Jones	AECI	Aaron Power
		Gas Standards Tech Committee	Liam Doyle



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NZEB Centre Enniscorthy



WWETB Current Range of Courses

NZEB Fundamentals

NZEB Trades Courses(Electrical, Carpentry, Plumbing, Plastering and Brick Laying)

NZEB Site Supervisor

NZEB Site Operative

NZEB Retrofit

Ventilation(Installation, balancing and commissioning

FabLab(Design using Solidworks, Autodesk-Autocad,

Inventor and Revit, 3D printing, Laser Cutting/ CNC milling,

Lathe and Router.



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Retrofit

- Retrofit training to take place in the Waterford Training Centre
- City & Guilds assured
- NZEB fundamentals required
- One day programme



Ventilation

- Two day course
- Examination each day
- City & Guilds assured
- Course to take place in Enniscorthy



FabLab

- In conjunction with Wexford County Council(LCDC)
- Design using *solidworks, autodesk –autocad, inventor and revit*
- *3D printing*
- *Laser cutting/ CNC milling*



NZEB General Operatives

- 40 hour programme
- City & Guilds assured
- Delivered through the Waterford Training Centre



Additional courses

Train the Trainer(TUS)

NZEB Trades Courses delivered through blended
learning

Virtual reality retrofit training to enhance the
current offering

Ecology of a hedgerow

Ecology of the seashore

Heat pump instillation

Plastic welding

National rollout using 5 additional NZEB Centres

- Cork Education and Training Board
- Laois Offaly Education and Training Board
- Mayo, Sligo Leitrim Education and Training Board
- Limerick Clare Education and Training Board
- Dublin Education and Training Board

Network of UN International Centres of Excellence (ICE)



- The first meeting of the International Centres of Excellence on High Performance Building took place at the BEEEX building in New York
- WWETB attended this meeting as part of the Irish delegation.

What do the Contractors and the Tradespersons have to say?

<https://www.youtube.com/watch?v=-QnHZqCSHSk>



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