Initiatives to promote environmental performance of buildings: Overview of the Portuguese situation in 2023



Workshop «Governança Territorial | Alterações Climáticas, Reabilitação e Habitação» Colégio da Trindade (evento híbrido) | November 3rd, 2023

0.a

Introduction

 Climate change and environmental degradation are an existential threat to Europe and the world



The European Green Deal 2019

- One of the 6 European Commission priorities for 2019-24 is the European Green Deal
- It aims to transform the European Union climate neutral by 2050





- The European Commission adopted the new circular economy action plan
- One of the targets of this plan are construction and buildings
- The construction and building industry has a substantial environmental footprint
- In the EU, buildings account for 40% of our energy consumption and 36% of greenhouse gas emissions

A renovation wave for Europe 2020

- The European Commission launched the Renovation Wave initiative
- Renovating the EU building stock will improve energy efficiency and enhance quality of life
- ► It aims to double annual energy renovation rates by 2030

Renovation Wave Priorities







Environmental performance of buildings plays an important role within **European Union** policy

What are the main initiatives implemented in Portugal aimed at improving the **environmental performance of buildings**?

Topics

- 1. Guidelines set by national strategies and plans
- 2. Environmental provisions set in the building regulatory framework
- 3. Voluntary certification systems oriented to construction products and buildings
- 4. Incentive programs and tax benefits
- 5. Training, information and public awareness



Scope



- Environmental resources analysed:
 - Energy
 - Water
 - Materials
 - Waste

0.b

Sustainable building

Sustainable building,

also known as green construction or sustainable construction,

is an approach to the

design,

construction

and operation

of buildings

that aims to minimize

their **environmental** impact

(or do no significant harm to the environment)

while promoting social and economic benefits

Some examples of strategies for sustainable building

Energy

- Use energy-efficient equipment and lighting systems
- Incorporate renewable energy sources such as solar panels and wind turbines
- Implement passive design strategies, such as adequate thermal insulation, natural ventilation and daylighting

Water

- Install low-flow fixtures and dual-flush toilets to reduce water consumption
- Use rainwater harvesting systems to collect and reuse rainwater
- ► Implement water-efficient landscaping practices

Materials

- Use sustainable building materials such as timber from sustainable forests and recycled materials
- Choose materials that have a low embodied energy, (which is the energy required to extract, manufacture, transport, and install the material)
- Prioritize materials that are non-toxic and do not pose health risks to occupants

Waste

- Implement a waste management plan that includes reducing waste generation, recycling, and responsible disposal of construction and demolition debris
- Use prefabrication and modular construction techniques to reduce waste and improve efficiency
- Reuse materials from previous construction projects





1.

National strategies and plans

National policies on environment and energy are formalized in a set of **strategies** and **plans** for various areas

The **main changes** should arise from guidelines and actions set in these strategies and plans

National strategies and plans

 There are, at a higher level, strategies and plans about climate change and sustainable development

Examples

- Roadmap for Carbon Neutrality by 2050
- National Strategy for Climate Change Adaptation
- National Energy and Climate Plan
- Action Program for Climate Change Adaptation

National strategies and plans

Energy

- ► The National Action Plan for Energy Efficiency
- The Long-Term Strategy for Building Renovation

Water

- The National Water Plan
- ► The National Program for Efficient Water Use

Waste

► The National Waste Management Plan

 A complete set of subsidiary strategies and plans lay down goals and actions for the management of energy, water, materials and waste

Roadmap for Carbon Neutrality 2050 (RNC2050)

 A sharing economy contributes to a lower possession rate of some equipment relocation of the demand to services (e.g., laundry, kitchen). ► The perspective of net zero energy buildings (NZEB) and Positive Energy Districts (PED) will mark the future of buildings.

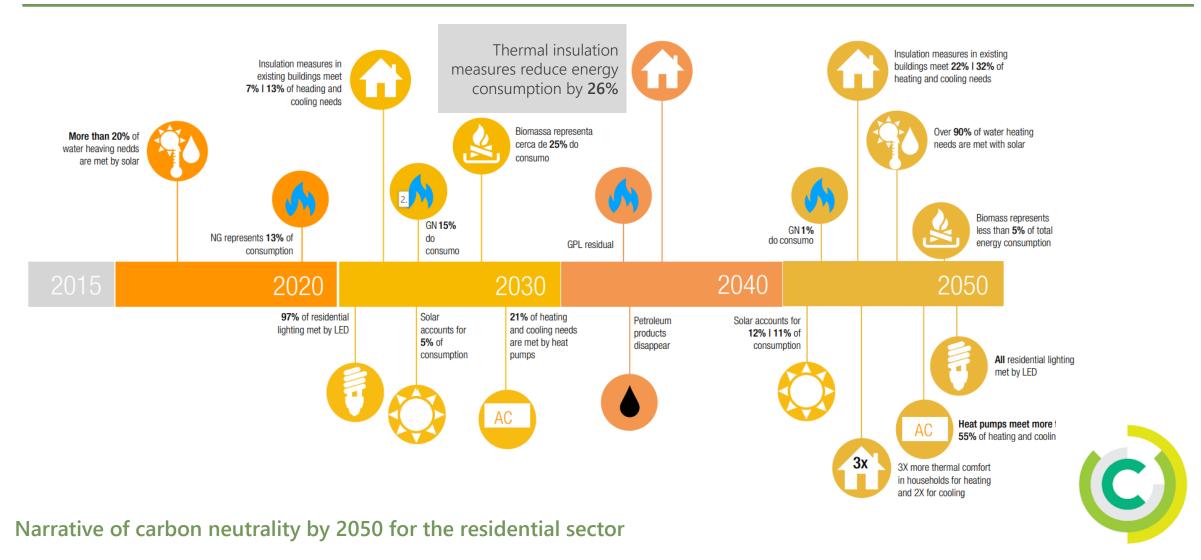
Increased working from home involves increased use of air conditioning, lighting and other equipment, relocating the energy demand to the residence sector.

The main decarbonisation drivers in the residential and services sectors are:

- Energy efficiency
- Electrification
- Insulation and rehabilitation
- Solar thermal and heat pumps



Roadmap for Carbon Neutrality 2050 (RNC2050)



2.

Building regulatory framework

The building regulatory system encloses the building regulations and the building control system

Building regulations set minimum requirements to ensure that buildings provide suitable conditions for their intended use, especially in terms of safety, health, comfort, functionality and accessibility, as well as to promote water and energy efficiency and sustainable construction practices

Building control aims to guarantee the application and enforcement of these minimum requirements

General Building Code

- The "General Building Code" sets the general requirements for construction in Portugal regarding construction, health, safety and aesthetics
- No requirements concerning energy saving or environmental protection are included

Terça-feira 7 de Agosto de 1951

I Série-Número 166



tiva a anûncios e à assinatura do Distrio do Gonerno, deve ser dirigida à Administração da Imprensa Nacional. As publicações liserárias de que se re-cobam 2 exemplares anunciam-se gratuliamento.

SUPLEMENTO

SUMÁRIO

Ministèrio das Obras Públicas:

Decreto-Lei n.º 38:382 — Aprova o Regulamento Geral das Edificações Urbanas — Revoga o Decreto de 14 de Fevereiro de 1903, os artigos 9.º e 10.º do Decreto n.º 902, os Decretos n.º 14:288 a 15:399 e o Decreto-Lei n.º 34:472.

MINISTÉRIO DAS OBRAS PÚBLICAS

Decreto-Lel n.º 38:382

Reconhecida a necessidade de se actualizarem as dis-posições do Regulamento de Salubridade des Edifica-ções Urbanas, aprovado pelo Docreto de 14 de Feve-reiro de 1903, foi para e efeite nomeada uma comissão que posteriormente recebeu a incumbência mais vasta de preparar um projecto de regulamento geral das edi-ficações. Na verdade, o quese mois século decorrido desde a promul gade que que se moi seculo decorrido desde a promul gade vevolução, teato nas ideias acerca da intervenção dos serviços oficiais nas actividades re-lacionadas com as edificações, como nas técnicas que lhes são aplicáveis.

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Desde há muito que se tem por necessário que aquals interrenção ae exerça não apenas no semido de tornar as edificações urbanas salubres, mas também no de as construir com es exigidos requisitos de solidoz e defessa contra o risco de inéndio e ainda de has garantir com dições mínimas de natureas estética, Opto por outro dições mínimas de natureas estética, Opto por outro diferente de la construir de la construir de la construir de para acessidade premente de correr rápida e econômicamente à carência, notória

por toda a parte, de edificações para habitação — im-põe a necessidade de se adoptarem novos processos cons-trutivos e de se conciliarem ao máximo as condições de irutivos e de se conciliarem co máximo as condições de salubridade, estética e esquunna das editicações com a imperiosidade de as construir a preço tal que as enas ventos dos futuros cupantes. Com base no trabalho elaborado pela comissão se promulga agora o Regula-mento Geral das Edificações, que fas parse integrante do presente diploma e que constitui um elemento de largo clazance e de grande projecção na vida nacional.

largo aleance o de grande projecção as vida nacional. Ele interesas, em primeiro lugar, ace serviços do Estado e dos corpos administrativos,—a estes em especial—, pela função directiva e disciplinadora que, através daquele instrumento legal, thes cabe exercer sobre as actividades relacionadas com as diferentes espécies de edificações, salvaguardando os interesses da colectividade, impondo respeito pela vida e haveres da população e peias condições estécias do ambiente local, religionado as já existentes, tudo de mode a tornar a rida da opopulação mais sadia e agradával e a dar nos núcleos urbanos e rurais um desenvolvimento, correcto, harmourbanos e rurais um desenvolvimento correcto, harmo

urosus e ruras un desenvorumento correcto, narmo-Convém calientar que muitas des disposições constan-tes do regulamento, fixando áreas, espessuras, eecções, distâncias, péc-direitos, números de pavimentos, etc., constituem limites mínimos ou máximos, conforme os casos, que año deverão ser ultrapassados. Deixa-se aos casos, que aso deverso ser ultrapassados. Dista-ee aos corpos administrativos a faculdade de, nos regulamen-tos especiais que promulgarem, poderem, conforme as circunstâncies, fastar-ee mais ou menos — no sentido correcto — dos valores prescritos, de modo a terem em atengão os casos para que não se justifique, sobretudo por motivos de estrita economia do custo da construção a adopção exacta dos limitos consignados no regula mento. A mesma regulamentação especial permitirá ainda aos corpos administrativos completar, sem lhes fazer perder o sentido, cortas disposições do regulamento geral à luz dos frutos da sua própria experiên-

General Building Code

- ► The Regime for the Rehabilitation of Buildings, approved in 2019, already incorporates the principle of environmental sustainability as one of its three core principles
- This principle is in alignment with the most recent doctrine on sustainable building

Artigo 5.º Princípio da sustentabilidade ambiental

- 1 The rehabilitation activity must be aimed at minimizing its environmental impact, embracing the goal of preserving natural resources and biodiversity, with a particular focus on reducing the extraction and processing of raw materials, waste production, and harmful gas emissions.
- 2 The rehabilitation of buildings contributes to environmental sustainability by increasing the useful life of buildings and should favor the reuse of construction components, the use of recycled materials, the reduction of waste production, the use of materials with reduced environmental impact, the reduction of greenhouse gas emissions, the improvement of energy efficiency and the reduction of energy needs, including energy incorporated into the construction itself, as well as the use of renewable energy sources.
- 3 At the end of the useful life of components or parts of the building, once maintenance and rehabilitation solutions have been exhausted, deconstruction or dismantling actions should be favored in order to meet the objectives set out in the previous paragraph, to the detriment of demolition, even if selective.

Energy



- There are building regulations that specifically deal with energy efficiency
- The regulations for energy efficiency of buildings are the *4*th *generation* (1990, 2006, 2013, 2020)
- The Energy Performance of Buildings Directive (EPBD) has been a significant driver for the development of the new versions of the regulations

Requisitos para a conceção ecológica dos produtos relacionados com o consumo de energia Decreto-Lei n.º 12/2011, de 24 de janeiro

Requisitos aplicáveis a edifícios para a melhoria do seu desempenho energético e Sistema de Certificação Energética de Edifícios

Decreto-Lei n.º 101-D/2020, de 7 de dezembro

Execução do Regulamento (UE) que define um regime de etiquetagem energética Decreto-Lei n.º 28/2021, de 20 de abril

Water

- Building regulations do not include provisions for the efficient use of water
- Some requirements may even make it difficult to implement water efficiency measures



Materials

- ► Asbestos (→)
- Lead and mercury
- Polychlorinated biphenyls and terphenyls
- Carcinogenic or mutagenic agents
- Biological agents
- Genetically modified microorganisms
- lonizing radiation
- Explosive atmospheres
- Arsenic compounds
- Short-chain chlorinated paraffins and azoic dyes

- Several separate specific regulations set provisions on use of dangerous substances or their removable from buildings
- ► The main purpose of these regulations is to ensure a **healthy environment**

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Remoção de amianto em edifícios, instalações e equipamentos de empresas

Lei n.º 63/2018, de 10 de outubro

Normas para a remoção dos materiais contendo amianto e para o acondicionamento, transporte e gestão dos respetivos resíduos de construção e demolição gerados | Portaria n.º 40/2014, de 17 de fevereiro

Remoção de amianto em edifícios, instalações e equipamentos públicos

Lei n.º 2/2011, de 9 de fevereiro

Disposições relativas à proteção sanitária dos trabalhadores contra os riscos de exposição ao amianto durante o trabalho | Decreto-Lei n.º 266/2007, de 24 de julho

Waste



- There is a building regulation for the management of waste resulting from construction or demolition of buildings
- It includes prevention and reuse, as well as collecting, transporting, storing, sorting, treatment, recovery and disposal operations

Building Control

 In 2010, the installation of photovoltaic solar panels, wind generators and solar heating panels for domestic hot water was exempt from building permit procedures



Building Control



- The energy certification is mandatory for all buildings that are sold, rented or subject to major renovation
- The certification aims to provide information on the energy performance of buildings and to promote the adoption of energy-efficient measures
- In 2022, more than 220 000 certificates were issued

3.

Voluntary certification systems

Consumers can play an active role in the protection of the environment by **choosing** more environmental friendly products

Eco-labels help consumers to choose products and buildings that have been **recognized** to have better environmental performance

Environmental Certification of buildings

- Three systems of green building assessment and certification were especially adapted to the Portuguese context
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- International systems of green building assessment and certification can also be used in Portugal
- According to available information, their implementation in Portugal is also not significant







Environmental Certification of buildings

- Three systems of green building assessment and certification were especially adapted to the Portuguese context
- Presently, none of these systems seam to be in use
- International systems of green building assessment and certification can also be used in Portugal
- According to available information, their implementation in Portugal is also not significant
- Level(s) is an emerging voluntary framework for measuring environmental performance, which holds the potential for broader application



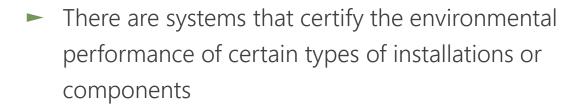
Environmental Certification of systems and products















 Several products and construction materials sold in Portugal have labels awarded by certification systems





https://www.adene.pt/edificios/

https://environment.ec.europa.eu/topics/circular-economy/eu-ecolabel-home_en

https://www.anqip.pt/

https://www.pefc.pt/

https://pt.fsc.org/

https://csustentavel.com/certificacao/

4.

Incentive programs and tax benefits

In order to improve environmental performance it is necessary to **change the characteristics** of new and existing buildings

These changes require a **financial investment** that it is important to encourage.

Incentive programs and tax benefits can serve this purpose

Incentive programs

► There are **incentive programs** to encourage the efficient use of energy and water in new and existing buildings



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- Funding from State Programs for the construction and renovation of buildings requires complying with high environmental performance standards, which can sometimes be even more demanding than those defined in building regulations



Incentive programs

- ► There are **incentive programs** to encourage the efficient use of energy and water in new and existing buildings
- ► Funding form State Programs for the construction and renovation of buildings requires complying with high environmental performance standards, which can sometimes be even more demanding than those defined in building regulations
- ► Tax rate that applies to buildings with improved energy or water efficiency can be **reduced**



5.

To improve the environmental performance of buildings, it is not only necessary to adopt effective policies in terms of regulations and investment, but also to:

- Promote a change in consumers behavior
- ► Increase the technical capacity of professionals
- Support the development of scientific knowledge

- There are many initiatives about sustainable construction in order to:
 - Ensure the training of professionals (master's degrees, postgraduate and professional courses)













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 - 4. Recognize best practices (awards)
 - 5. Lead change by example (public leadership programs)





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Conclusions

There are **numerous initiatives**aimed at promoting sustainable building
making it challenging to provide
a complete and precise review

Conclusions

- Many of the initiatives aimed at improving environmental performance of buildings are outlined in plans and strategies
 - While some initiatives enforce obligatory regulations, other target voluntary improvements
 - ► Energy remains the predominant focus of initiatives, but efforts are also directed towards water, materials and waste
 - Building regulations on water conservation and sustainable building materials
 have remained unchanged
 - Several changes in the building regulations were due to the
 transposition of European directives into Portuguese legislation

Over the past 10 years,
sustainable building has evolved
from an emerging trend
into a widely recognized challenge
that consistently permeates discussions
within the construction industry,
catalysing a shift in practices

Thank you for your attention



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