ENGENHARIA

Processos de Produção - Reciclagem - Materiais Sustentáveis - …

ARTS 4 People & Earth

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Who am I? Why me?

- University of Porto profile
- Emissions built environment

European Green Deal (0,4T)

- Green Deal (19-24 strategy and policy)
- LEVELS
- New European Bauhaus

Some data (materials)

- Netherlands >75% (weight) construction was for recycling; Germany and Belgium > 50%; USA 25%
- Bricks and tiles - up to 30% perdas (weight), construction sites about 30% (weight)
- Lifecycle - brick wall – 70 years, gypsum – 30 years
- Embedded energy (GJ/t): concrete – 1,0; Brick – 3,1; Glass – 33,1; Steel – 47,5; Aluminium – 97,1; Plastic – 162.
- Kg CO_2 per Kg to produce cement: USA – 1,0; Europe – 0,85; Japan – 0,72.

More data

- Embedded Energy (GJ/m2):
- Office, appartment – 10 a 18;
- House – 9 a 13;
- Industry – 7 a 12;
- Road – 2 a 10.
- CO2 per Kg/material: Cement/Bricka/Steel/Wood – 120/50/25/1,8

What to do?

Global sustainability: challenge or opportunity for engineering?

USA

- US Green Building Council
- LEED - Leadership in Energy and Environmental Design
- EPA

Global sustainability: challenge and opportunity for engineering

- Engineers are the great problem solvers of the world
- Understanding the problem
- Climate, environment, resources, …
- United Nations 17 Sustainable Development Goals
- God created the World and engineers change it!

UNESCO II Engineering Report (4Mar21)

- **Engineering for Sustainable Development**
- 4.ENGINEERING EDUCATION AND CAPACITY-BUILDING FOR SUSTAINABLE DEVELOPMENT
- 4.1 Engineering education for the future;
- 4.2 Lifelong learning in engineering: an imperative to achieve the Sustainable Development Goals;
- 4.3 Engineers' continuing professional development

GreenComp

- The European sustainability competence framework (Jan22)
- Knowledge, Skills and Attitudes descriptors
- Embodying sustainability values
- Embracing complexity in sustainability
- Envisioning sustainable futures
- Acting for sustainability

Sustainability Competences of Engineers (Use GreenComp)

- Inclusion on all engineering education/training programs of competences/learning outcomes
- Training for active engineers (mandatory!)
- Continuing Professional Development/Lifelong learning
- Required by professional organizations to keep status
- Medium and long term impact - graduates
- Short term impact - professionals

Obrigado!