

PREPARE



Education and Culture DG

Lifelong Learning Programme

TREO

Concept of Resource Efficiency Course Content

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1 Introduction

This document tries to summarize the main concepts related to Resource Efficiency from a global perspective, to a sectorial approach; it considers each of the 5 analyzed sectors, after the completion of the 5 sectorial final courses: Construction and Building, Mobility and Transport, Energy Efficiency of Products, Food and Tourism.

It includes the following main categories, as the main contents of the developed courses:

- Introduction to major concepts of Resource Efficiency
- Energy: renewables and efficiency
- Water efficiency
- Material efficiency

Resource efficiency addresses the three sustainability dimensions individually and synergistically:

- Production Efficiency: optimization of the productive use of natural resources (materials, energy and water);
- Environmental management: minimization of impacts on environment and nature through reduction of wastes and emissions; and
- Human Development: minimization of risks to people and communities and support for their development.

Resource efficiency practices generate multiple benefits that are relevant to many of today's most pressing global challenges, including:

- Mitigation of GHG emissions and adapting to climate change;
- Responding to increasing scarcity of water, fuels and other materials;
- Providing decent jobs; and
- Halting environmental degradation.

2 Sectorial approach of the Resource Efficiency Concept

Special mention must be done about the specific resource efficiency contents related to each of the analysed sectors. The following sub-chapters include a summary of the main course contents developed in each of the 5 sectors.

2.1. Mayor concepts for eco-efficiency

The following table compares the mayor concepts for eco-efficiency in each of the analysed sectors:

Construction and Building	Mobility and Transport	Energy Efficiency of Products	Food	Tourism
<p>Introduction to the sector, legislation, standards, eco efficiency and approaches to increase resource efficiency</p> <ul style="list-style-type: none"> • EU building directive • Link with climate change • resource consumption (materials, chemicals) <p>Major issues with resource efficient buildings:</p> <ul style="list-style-type: none"> • Energy consumption of buildings • Water consumption • Use of renewable materials • Use of chemicals 	<p>General data on the sector and motivation for eco-efficiency in the motibility sector:</p> <ul style="list-style-type: none"> • Reduction of emissions and resources saving • Link with climate change <p>Sustainability</p> <p>Major concepts of eco-efficiency in relation to motibility</p> <ul style="list-style-type: none"> • Fuel saving • Recycling • Environmental impact (air emissions) • Territory, spatial and urban planning 	<ul style="list-style-type: none"> • Concept of energy efficiency • Key environmental impacts <p>Quantification of environmental impacts</p> <p>The motivation for participation in a VET course on eco-efficiency focusing on energy efficiency related products are:</p> <ul style="list-style-type: none"> • Energy consumption and its environmental impact (minimizing emissions) • Maximize energy efficiency in all aspects of our lives <p>Produce more renewable energy and (consume) less fossil energy</p>	<p>The challenge</p> <ul style="list-style-type: none"> • 90 Mt of food is wasted annually in Europe (EU COM, 2014) • One third of all food produced in world is wasted (Fao, 2013) • 40 % of all food waste generated occurs at retail and consumer level <p>Introduction to the European Food sector:</p> <ul style="list-style-type: none"> • From "farm to fork" and traceability <p>The "players" in food supply chain</p> <ul style="list-style-type: none"> • Contribution to GHG • Environmental impacts • Contribute to a diverse landscape and rich biodiversity 	<p>General data on the sector and motivation for eco-efficiency in the tourism sector:</p> <p>Key environmental impacts from tourism sector:</p> <ul style="list-style-type: none"> • depletion of natural resources: water, local resources, • land degradation • pollution of soil, air and water, noise • solid waste and littering <p>Major concept of eco-efficiency in tourism:</p> <ul style="list-style-type: none"> • sustainable tourism • eco-tourism • destination management <p>Resource Efficiency in tourism sector</p>

2.2. Energy: Renewables and Efficiency

In the case of the renewables energy and energy efficiency related training contents, the comparison among sectors is as follows:

Construction and Building	Mobility and Transport	Energy Efficiency of Products	Food	Tourism
Energy efficiency and renewable energy: <ul style="list-style-type: none"> • Passive building • Smart buildings • Use of renewables for heating • Solar thermal • Photovoltaics • User integration • Energy generating building • Monitoring and controlling energy consumption 	Renewable energies and energy efficiency: <ul style="list-style-type: none"> • Regulation • Fuel efficiency and alternative fuels • Batteries and new engines • New electric solutions in automotive solution • Lighting • Efficient driving concepts 	Various approaches: <ul style="list-style-type: none"> • Regulation on limiting CO₂ emissions and promoting energy efficiency • Inclusion of bio fuels and targets with regard to bio fuels • Fuel efficiency incentives and fuel efficiency labelling See also material efficiency – options using less material and water are usually energy-efficient, too	Food contribute to around 25 % of total GHG emissions; Of this the social practice of eating stands for around 25 % of the CO2 emission. <p>Climate friendly food consumption:</p> <ul style="list-style-type: none"> • The menu plan → Changing of more GHG heavy recipes • Recipes → Substitution among and within food groups • Ingredients → Season and local 	Energy efficiency and renewable energy in accommodation sector (hotels) <ul style="list-style-type: none"> • Green buildings • Efficient energy systems for cooling/heating/ventilation/lighting • Energy efficient cooking (equipment and practices) • Energy efficient laundry (equipment, practices, policies) • Use of renewable energy resources for heating , warm water and cooking

2.3. Water efficiency

The following table compares water efficiency related training contents in each of the analysed sectors:

Construction and Building	Mobility and Transport	Energy Efficiency of Products	Food	Tourism
<p>Water efficiency:</p> <ul style="list-style-type: none"> • Use of water saving fixtures • Water efficient household appliances • Rainwater harvesting • Use of grey water • Monitoring and controlling water consumption 	<p>Water efficiency:</p> <ul style="list-style-type: none"> • Impact of transportation on the water • Minimizing of water for transportation cleaning • Other water efficiency concepts 	<p>Water is used in connection with transportation mainly by 2 ways:</p> <ol style="list-style-type: none"> 1. As transportation way: <ol style="list-style-type: none"> a. Options to minimize the impact on the water are: <ol style="list-style-type: none"> i. Organizing training for ship's crew and ship's passengers how to avoid water pollutions ii. Use techniques which can decrease the direct pollutions of water. 2. As cleaning source to clean transportations and transportation ways: <ol style="list-style-type: none"> b. Options to minimize the use of water for cleaning are: <ol style="list-style-type: none"> i. Use techniques which can save water (like nanotechnology for cleaning cars to save more than 100 liters water per treatment) ii. Optimize with the aid of guides the car washing techniques to reuse water and to use as less water as possible 	<ul style="list-style-type: none"> • Reduce nutrient emissions to water • Minimize water consumption 	<p>Water efficiency and waste water minimization in accommodation sector (hotels)</p> <ul style="list-style-type: none"> • Water supply and avoidance conflicting with community • Efficient water equipment (faucets, shower, pools) • Waste water minimization and waste water treatment • Water efficient systems for cooling/heating • Water efficient cooking (equipment , practices, policies) • Housekeeping policies • Water efficient laundry (equipment, practices, policies)

2.4. Material Efficiency

This last table includes a comparison of material efficiency related training courses, in each of the 5 analyzed sectors:

Construction and Building	Mobility and Transport	Energy Efficiency of Products	Food	Tourism
<p>Material efficiency:</p> <ul style="list-style-type: none"> • Choice of construction materials • Choice of insulation materials • Ecological construction materials (flooring, painting, furniture) and reduction of harmful substances • Regulated materials and chemicals • Testing for emissions 	<p>Material efficiency:</p> <ul style="list-style-type: none"> • Current and innovation practices for material efficiency in the transport sector 	<p>Current practice: legislation demanding end of life management of vehicles by stringent material recycling targets (EU End of life directive).</p> <p>Other options (in practice not yet stimulated by government)</p> <ul style="list-style-type: none"> • Smaller and lighter cars • Cars using less critical materials • Cars using more uniform materials (e.g. similar types of plastics) <p>At a higher level:</p> <ul style="list-style-type: none"> • Prevention of mobility (e.g. stimulating working at home, flexible workspaces) • Car sharing schemes • Other incentives to reduce car ownership and use and using mixes of public transport and sharing systems as well • Differentiated taxation of transport modalities, or taxing car commuters, compensation schemes of employees <p>Logistical centres that support multi-modal freight transport</p>	<ul style="list-style-type: none"> • Reduce impacts from toxic substances and materials' • Reduce waste from distribution, from manufacturing to consumption → less GHG emissions 	<p>Material efficiency and waste minimization</p> <ul style="list-style-type: none"> • Efficient use of materials including food products, consumables, detergents) • Supplying policies (bulk, by local, avoid un-necessary material, returnable packaging) • Avoidance of and /or safe use of dangerous chemicals • Waste segregation and recycling