The European Commission's science and knowledge service

Joint Research Centre

European Commission

CONVEGNO REGIONALE

Gli aggregati riciclati nelle opere edili pubbliche e private: le opportunitá ambientali ed economiche

The EU GPP criteria for road design, construction and maintenance

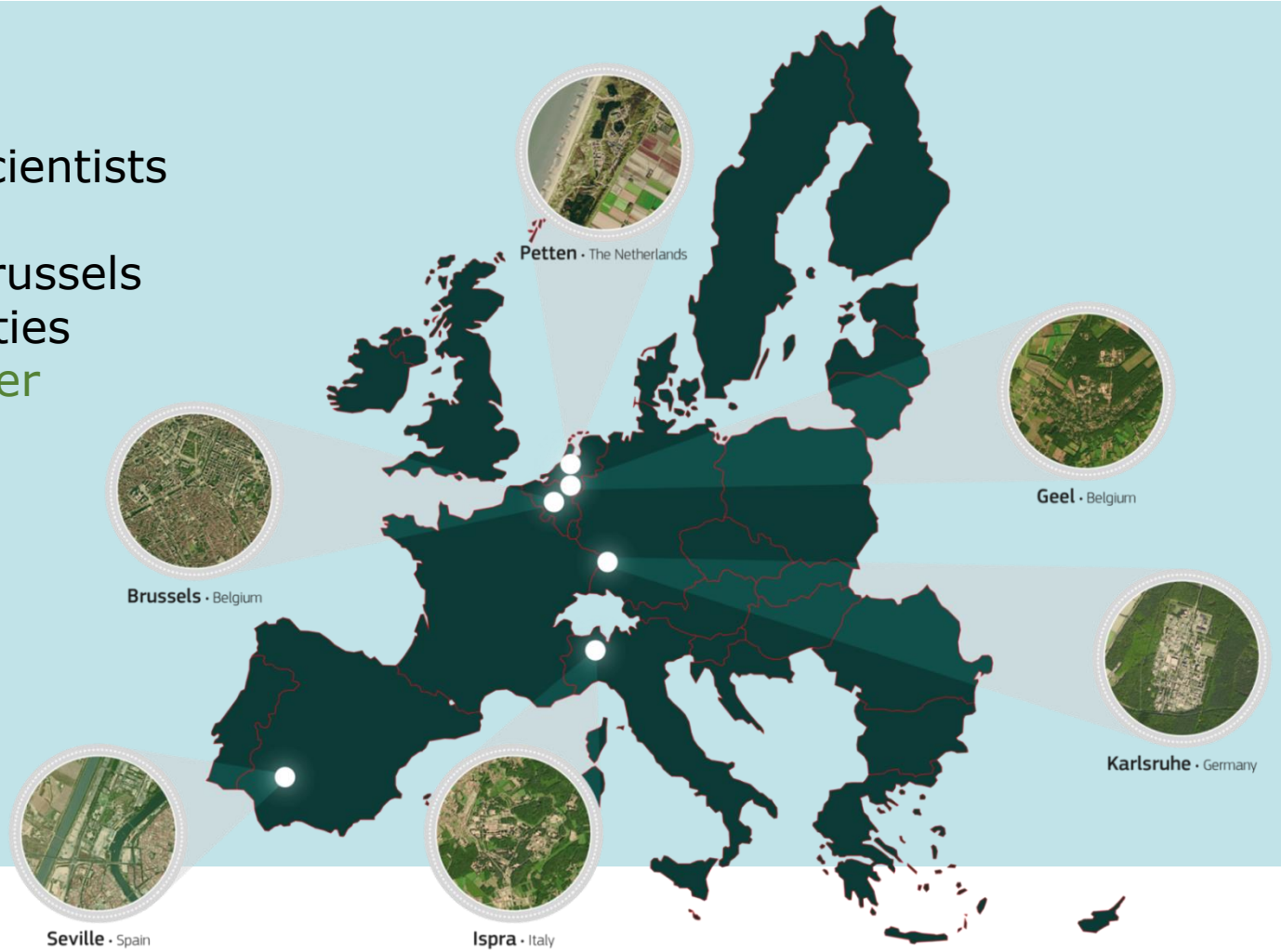
Elena Garbarino, Joint Research Centre, European Commission

10 October 2018, Auditorium, Metropolitan City of Turin, Turin

European Commission

The Joint Research Centre at a glance

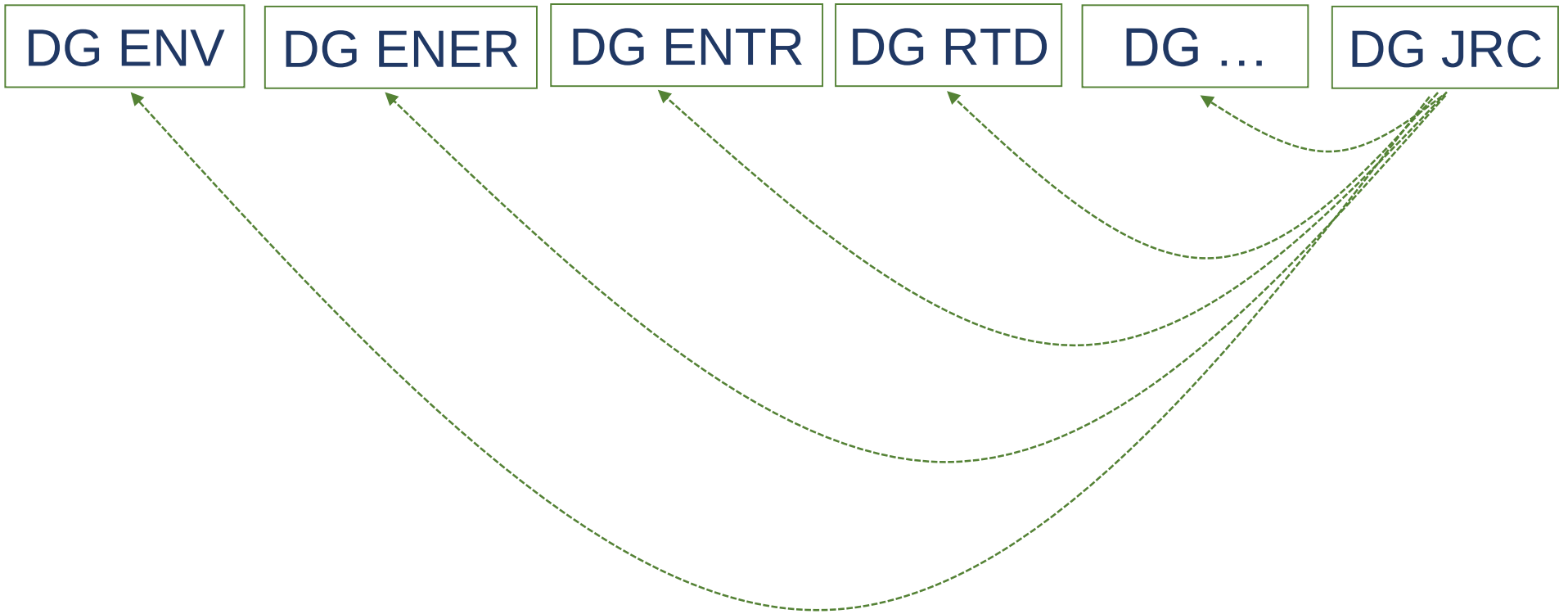
3000 staff
Almost 75% are scientists and researchers.
Headquarters in Brussels and research facilities located in 5 Member States.



Growth and Innovation
Circular Economy and Industrial Leadership Unit

European Commission

Joint Research Centre in the context of the European Commission:

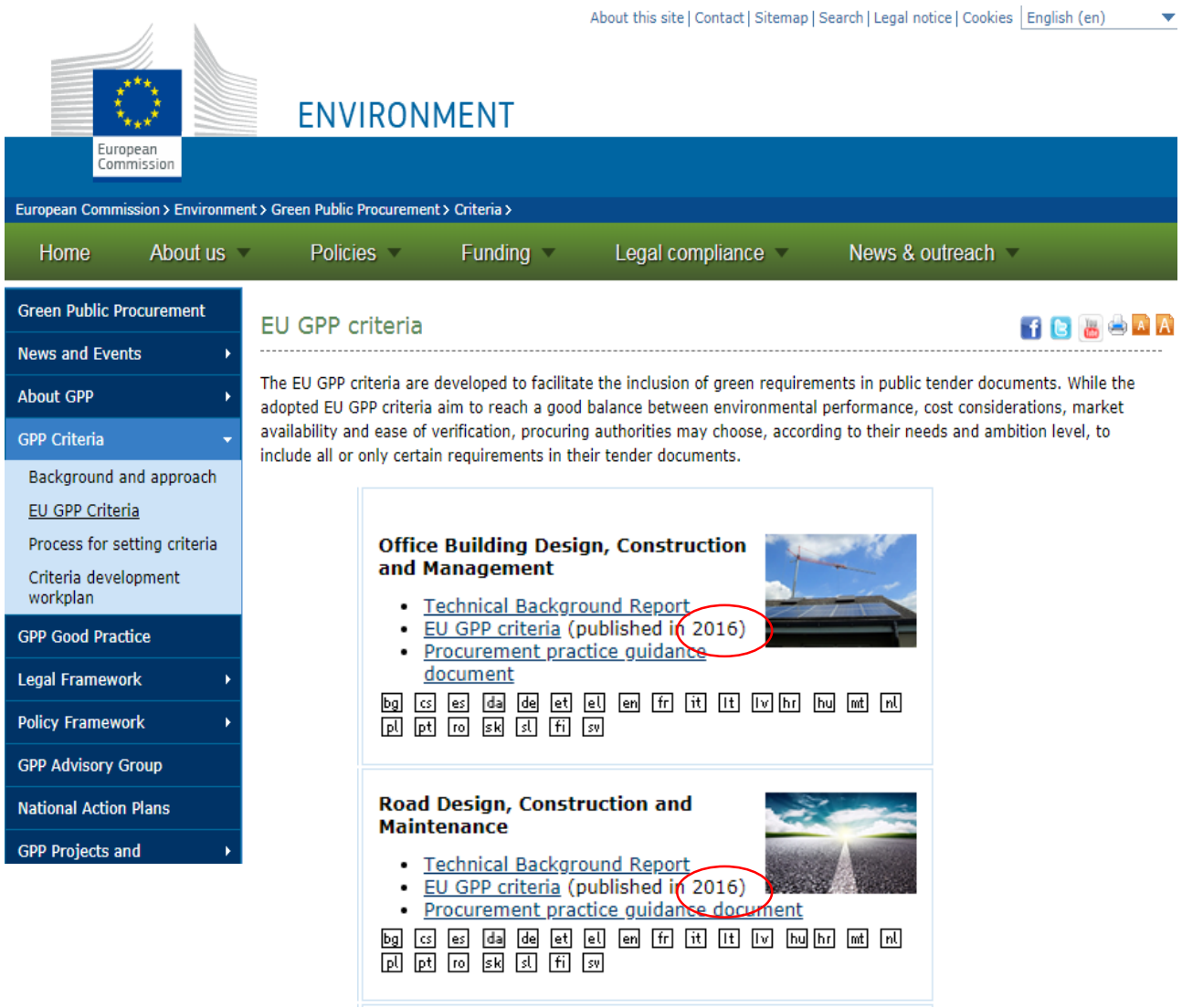


Provide support to EU policy making process by developing **science based responses to policy challenges** that have both a socio-economic and a technological dimension

European Commission

EU GPP criteria

http://ec.europa.eu/environment/gpp/eu_gpp_criteria_en.htm



Building sustainability performance

http://ec.europa.eu/environment/eussd/buildings.htm

2015-2017

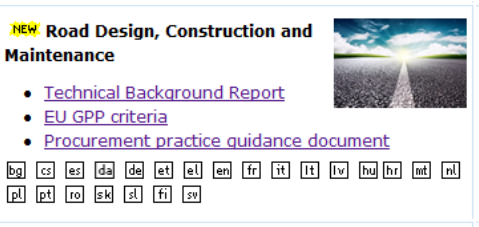
- COM(2014)-445 on resource efficiency opportunities in the building sector
- Common EU approach
- Voluntary reporting framework
- Indicators designed to link the building's impact with the priorities for sustainability at EU level

Part 3: How to make performance assessments using Level(s)

Macro-objective 2: Resource efficient and circular material life cycles

European Commission

EU GPP criteria for roads



http://ec.europa.eu/environment/gpp/eu_gpp_criteria_en.htm

Dec 2012

Product Group Identification (GPP AG)

Preparatory work

EU GPP Advisory Group + 121 stakeholders (PA, Industry, NGOs)

Preliminary Report

Technical report (draft criteria areas and guidance) 1

12.03.2014

1st AHWG

Technical report (draft criteria and guidance) 2

28.01.2015

2nd AHWG

Stakeholders written consultation on specific sub-topics

28.04.2015

GPP Advisory Group

Final Draft GPP Criteria

ISC

10.06.2016

Final GPP Criteria SWD(2016) 203

European Commission

EU GPP criteria for roads

⇒ aimed at **facilitating public authorities** the **purchase** of products, **services** and **works** with **reduced environmental impacts**.
⇒ The use of the criteria is **voluntary**.

The criteria are divided into **Selection Criteria**, **Technical Specifications**, **Award Criteria** and **Contract Performance Clauses**.

For each **set of criteria** there is a choice between **two ambition levels**:

- *The **Core criteria** are designed to allow **easy application of GPP**, focussing on the **key area(s)** of environmental performance of a product and aimed at **keeping administrative costs** for companies **to a minimum***

- *The **Comprehensive criteria** take into account **more aspects or higher levels of environmental performance**, for use by authorities that want **to go further** in supporting environmental and innovation goals*

European Commission

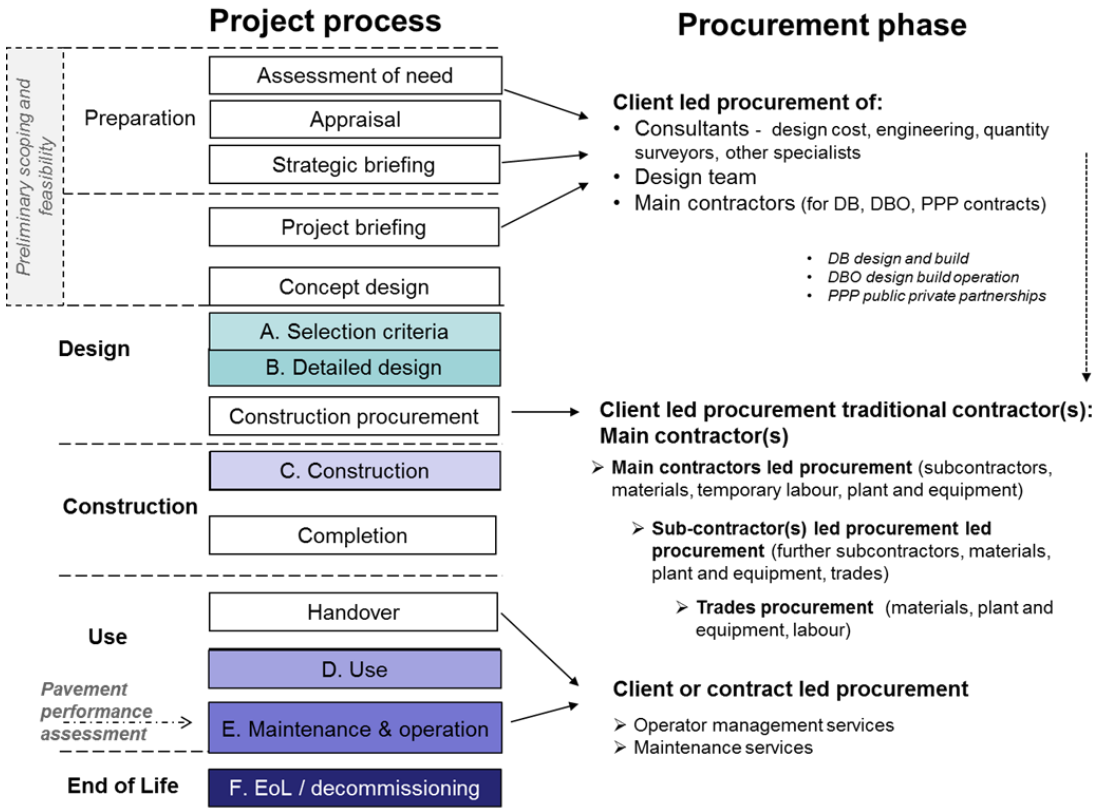
Key environmental impacts

- **Main environmental impacts** from daily traffic during the **use phase**
  - **Rolling resistance** => highest impact potential related to the vehicle fuel consumption
  - **Congestion** => external or internal factors
- **Second largest environmental impacts** during the **construction phase**
  - **Hot-spots** related to **materials production**, including extraction and **transportation**
  - In complex orography, relevant impacts from **earthworks** and **ground works**
- **Maintenance and rehabilitation** => a **complex network** of design strategies, dominated by materials production and congestion. Clear connection between **durability** and **sustainability aspects**.
- **Influence** of **traffic flow** on the relative importance of the identified hot-spots (high traffic *vs* low traffic roads)
- Other impacts not generally included in LCA studies: **environmental noise emissions** and **storm-water drainage** => opportunity for road drainage systems ("hard or soft engineering") to provide much needed **flood capacity**

GPP criteria for roads overview

	Phase
Criteria related to the ability of the tenderer	A
Pavement-vehicle interaction	
Performance requirements on rolling resistance	B C
Resources efficient construction	
Life cycle performance	B C E
Recycled content	B C E
Materials transportation	B
Asphalt	B C E
Soil and Waste Management Plan	B C E F
Water and habitat conservation	
Water pollution control components in drainage system	B C
Stormwater retention capacity	B C
Criteria for habitat creation and facilitating the passage of small fauna	B C E
Noise	
Noise emission during construction and maintenance	B C E
Low-noise surface pavements	B C D
Other environmental criteria (Lighting – road markings)	
Congestion	
Traffic congestion mitigation plan	B C E
Maintenance and rehabilitation strategies	
Durability	B
Maintenance and rehabilitation strategy plan	B D E

Procurement phases



European Commission

Resources efficient construction criteria

Title of the criterion	Description	Proc. phase	Crit. classif.	Criteria type
RESOURCES EFFICIENT CONSTRUCTION				
Life cycle performance				
LCA performance	Carry out a **Carbon Footprint CF (Core)** or a **LCA (Comprehensive)** for the **main road elements**	B.	Core & Compr.	Award
Commissioning		C. E.	Core & Compr.	CPC

A. Selection criteria
B. Detailed design
C. Construction
D. Use
E. Maintenance & operation
F. End of Life

Level of ambition and technical complexity

Examples of tools for roads and materials

SEVE Eco-comparateur

FRANCE
http://www.seve-tp.com/Security/UserLogin.aspx?ReturnUrl=%2fdefault.aspx/

CO2-PERFORMANCELADDER

DuboCalc

The NETHERLANDS
https://www.skao.nl/home_en
https://www.dubocalc.nl/en/

TRAFIKVERKET Klimatkalkyl

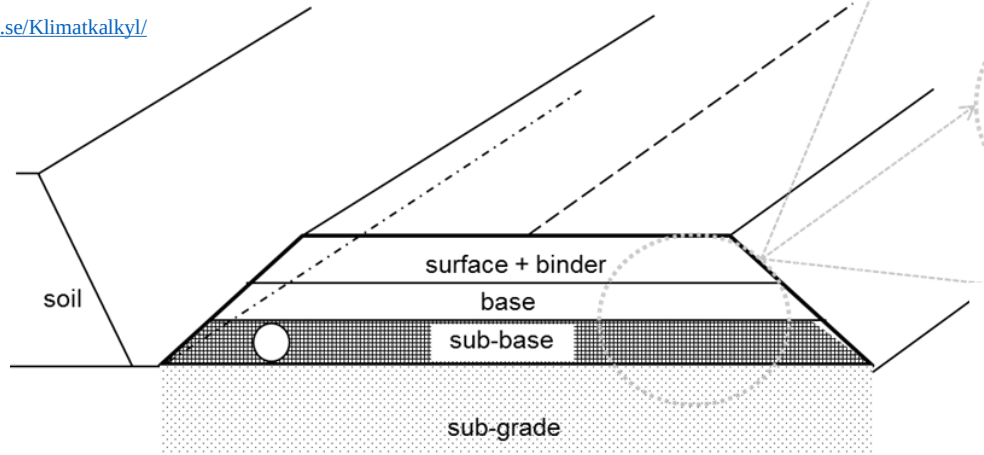
SWEDEN
http://webapp.trafikverket.se/Klimatkalkyl/

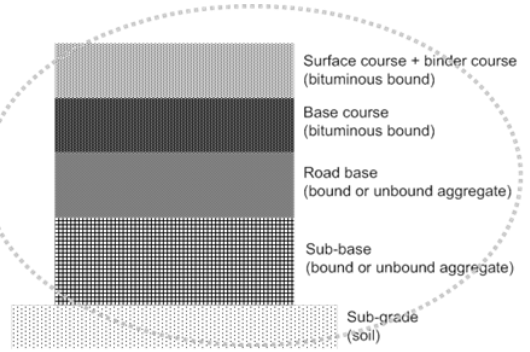
Carbon ROAD MAP

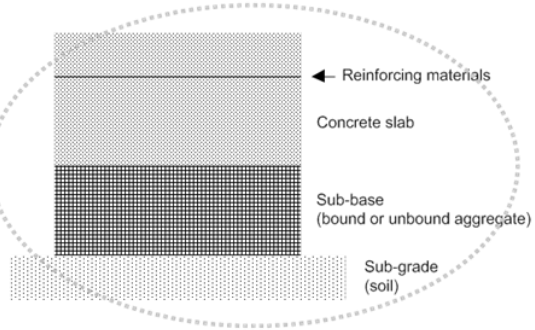
ERA Net ROAD
CEREAL – LICCER - MIRAVEC
http://www.cedr.eu/strategic-plan-tasks/research/era-net-road/call-2011-energy//

CHANGER Greenhouse Gas Calculator

International - IRF
https://www.irfnet.ch/environment.php?id=74&title=Introduction







European Commission

Resources efficient construction criteria

Title of the criterion	Description	Proc. phase	Crit. classif.	Criteria type
RESOURCES EFFICIENT CONSTRUCTION				
Recycled content				
Incorporation of recycled content	**15%** - **30%** by **weight** of recycled content, reused content and/or by-products	B.	Core & Compr.	Award
	Recycled content verified for each **representative batch of product**	C. E.	Core & Compr.	CPC

A. Selection criteria
B. Detailed design
C. Construction
D. Use
E. Maintenance & operation
F. End of Life

Level of ambition and technical complexity

Material		Standard practice (% mass)	Good practice (% mass)	Best practice (% mass)
Aggregates	Coarse aggregates in concrete	0 [c]	20 [a, b, c]	100 [c]
	Coarse aggregate in low strength mass concrete	0 [c]	30 [c]	100 [c]
	Unbound in civil applications	0-50 [c]	25-80 [c]	100 [c]
	Aggregates in hydraulic bound and cement bound materials	0 [c]	60 [c]	100 [c]
	Aggregate in bituminous bound pavements (off-site)	0 [c]	10 [c]	40 [c]
	Aggregate in bituminous bound pavements on-site/off-site cold process	100 [c]	100 [c]	100 [c]
	Aggregates in road sub-base		100 [e]	
	Recycled concrete aggregates	30 [f]		
Asphalt	HMA and/or WMA – RAP hot mix recycling off-site		30-80 [b]	
	HMA and/or WMA – RAP hot mix recycling of off-site		30-50 [b]	
	HMA and/or WMA– RAP cold method in hot mix recycling off-site		10-40 [b]	
	CMA – Cold mix recycling in a stationary plant		90 [b]	
	HMA and/or WMA - on-site hot mix recycling of RAP			100 [b]
	CMA – on-site cold mix recycling of RAP	100 [b, c]	100 [b, c]	100 [b, c]
	[a] EC JRC 2012 [b] Biois, EC 2011 [c] WRAP 2008b [d] WRAP 2009 [e] ICE Protocol 2008 [f] WBCSD 2009			

CPR 305/2011/EU

- aggregates for unbound and hydraulically bound materials: EN 13242
- asphalt pavement: EN 13043, EN 13108-1 to -8
- concrete pavement: EN 12620, EN13877

Example of recycled content used in construction materials in different practices

European Commission

Resources efficient construction criteria

Level of ambition and technical complexity

Title of the criterion	Description	Proc. phase	Crit. classif.	Criteria type
RESOURCES EFFICIENT CONSTRUCTION				
Materials transportation				
Performance requirements	Points will be awarded in proportion to the reduction in the **CO_2e emission/tonne** of transported aggregates	B.	Core & Compr.	Award
Excavated materials and soils management and waste management				
Excavated materials and soil management plan	▪ Overall **site soil balance** ▪ **Estimates** of materials **diverted from landfill**, ▪ **%** of materials **reused and/or recycled <u>on-site</u>**, % of materials reused and/or recycled **<u>off-site</u>** ▪ **Management of top-soil**	B.	Core & Compr.	TS
Commissioning		C.	Core & Compr.	CPC
Demolition waste audit and management plan	A **minimum** of **70% (Core)** and **90% (Comprehensive)** by weight of **non-hazardous C&DW**, including backfilling (with limitations), prepared for re-use and recycling potential	E. F	Core & Compr.	TS

A. Selection criteria
B. Detailed design
C. Construction
D. Use
E. Maintenance & operation
F. End of Life

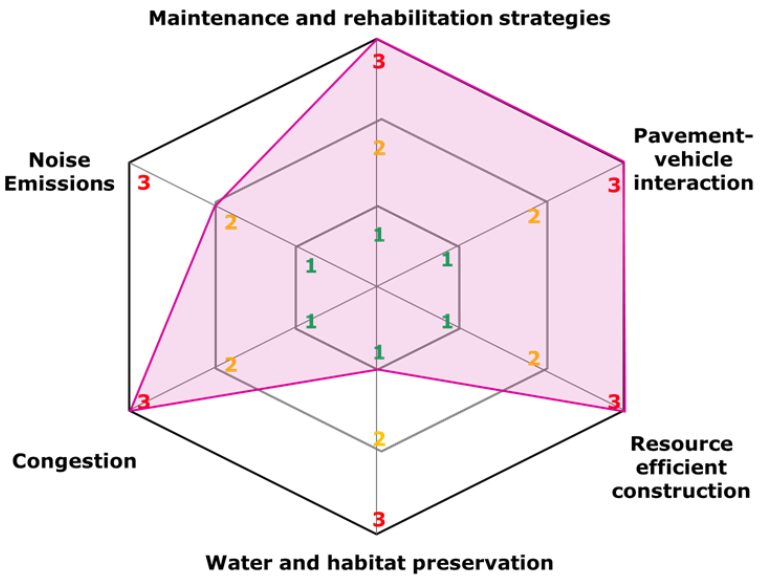
European Commission

Durability criteria

Title of the criterion	Description	Proc. phase	Criteria classif.	Criteria type
CRITERIA ON MAINTENANCE AND REHABILITATION STRATEGIES				
Durability				
Performance requirements	The **nominal service lifetime** of the road pavement, excluding the surface layer, shall be as **specified by the Road Authority** but should **not** be **lower** than: ▪ **15 (Core) – 20 (Comprehensive) years** for the **binder course**, with the option to reduce to no less than 10 years in case of specific conditions (*to be specified in the ITT*) ▪ **20 - 40 years** for the **base course** for flexible/semi-rigid pavements and for the concrete slab for rigid pavements ▪ **40 - 60 years** for the **sub-base** *Additionally the contracting authority and NRA/local authority may specify a minimum nominal service lifetime for the surface course if the specific conditions of the road pavement allow setting a threshold*	B.	Core & Compr.	TS

A. Selection criteria | D. Use
B. Detailed design | E. Maintenance & operation
C. Construction | F. End of Life

Criteria selection web



Example of criteria selection web for a high traffic rural road close to populated areas with congestion problem

European Commission

GPP good practice

http://ec.europa.eu/environment/gpp/case_group_en.htm

GPP In practice

Issue no. 83
September 2018

Sustainable reconstruction of the A6 motorway in the Netherlands

Rijkswaterstaat (Netherlands)

Award criteria used in the tender

Risk management plan
Traffic congestion restriction plan
Sustainability

CO2-PERFORMANCELADDER
DuboCalc

Results

- Smart construction transportation solutions which reduced the need to transport materials by road;
- Smart use of asphalt, which lowered the required quantity;
- Use of **recycled materials**

GPP In practice

Issue no. 75
October 2017

Using recycled concrete in the construction of new buildings

State of Berlin (Germany)

GPP In practice

Recycled asphalt used for road resurfacing

CITY OF HAMBURG, GERMANY

The refurbishment and resurfacing of one of Hamburg's main roads

- Use of **Reclaimed Asphalt Pavement** (**RAP**) milled from the current surface course

European Commission

Additional information on GPP and on research projects

Managed by ICLEI

SUSTAINABLE PROCUREMENT PLATFORM

http://www.sustainable-procurement.org/programmes-and-projects/

GPP 2020 | procurement for a low-carbon economy

http://www.gpp2020.eu/home/

Procurement FORUM

https://procurement-forum.eu/

Sustainable Construction Interest Group

SCI-NETWORK Sustainable Construction & Innovation through Procurement

FEHRL

NATIONAL ROAD RESEARCH CENTRES IN PARTNERSHIP

http://www.fehrl.org/communities/projects

CEDR Conference of European Directors of Roads

http://www.fehrl.org/communities/projects

Low environmental impact road maintenance

Metropolitan City of Rome Capital, Italy

This was a simplified restricted procedure for roac
Metropolitan City of Rome Capital. The Special Ter
maintenance works envisaged many conventional
permitted a CO2 saving. The tender has been divi

Click here to download the full tender model.

lots | infrastructure

- Use of **recycled bituminous mix (CMA)**

Renovation of the ex INPS building

State Property Office, Region Liguria

This was an open procedure based on the criteria of economically most advantageous tender for the sustainable renovation of a building by the State Property Office, Region Liguria.

Click here to download the full tender model.

Image source: courtesy of State Property Office, Region Liguria

renewables | reconstruction

- Energy-efficient retrofitting of the building and use of construction **materials with recycled content**

4680 t of CO_2 eq savings

1230 toe of energy savings

Future tenders

http://www.gpp2020.eu/low-carbon-tenders/open-tenders/

- Rijkswaterstaat (NL)
- ICAEN (ES)
- Ministry of Territory and Sustainability of the Government of Catalonia (ES)
- OesteCim (PT)

European Commission

Contact us @ JRC-B5-ROADS@ec.europa.eu

Thanks for your attention

Contact Elena Garbarino, Rocio Rodriguez Quintero, Shane Donatello, Miguel Gama Caldas and Oliver Wolf

European Commission
Joint Research Centre
Growth and Innovation
Circular Economy and Industrial Leadership
http://susproc.jrc.ec.europa.eu/road/

Connect with us on:
EU Science Hub: https://ec.europa.eu/jrc

European Commission