

*Figure 1: Environmental impact assessment procedure*

Development programmes and investor initiatives		STRATEGIC LEVEL	
Ministry responsible for energy			
Decision on the CEIA			
Environmental report	Draft NEP proposal	Two-year period for a follow-up repeated review	
Public discussion			
NEP proposal			
Consideration and adoption by the Government of the Republic of Slovenia		Requirements for additional studies	
Consideration of the NEP by the National Assembly		Guidelines for the CEIA:	
		for of municipal programmes	
		of spatial plans	
	CEIA for spatial plans and municipal operational programmes		
COMPREHENSIVE ASSESSMENT OF THE SPATIAL PLAN AND THE PROJECT ASSESSMENT	Environmental consent for the project		
	Acquisition of a building permit	Monitoring	

*Figure 2: Use of data in comprehensive environmental impact assessments for other plans and programmes*

	CEIA for the OP for the development of environmental and traffic infrastructure 2007–2013	
Environmental impact assessment carried out for the Ordinance on Spatial Planning Strategy of Slovenia	CEIA carried out for the NEP measures	CEIA for: <ul style="list-style-type: none"> <li>- RDP and NMRMP and</li> <li>- OP BIOW and WMP (assessment is underway)</li> </ul>

Guidelines from the Environmental Report on: <ul style="list-style-type: none"> <li>- CEIA for spatial plans</li> <li>- CEIA for municipal programmes</li> <li>- EIA for interventions into the environment</li> </ul>	CEIA procedures for spatial planning if NEP measures involve the construction of structures	
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*Figure 3: Schematic representation of the CEIA procedure*

	Decision on the implementation of the CEIA procedure	
Implementation and monitoring of environmental impacts		Decision on the scope of the environmental impact assessment
Reporting		Determination of environmental objectives and indicators
Optimisation of NEP measures and determination of mitigation measures		Environmental platform
	Environmental impact assessment	

**Figure 4: The procedure for the environmental impact assessment and planning of NEP measures**

Preliminary draft NEP proposal	Decision on the CEIA for NEP	
	Determination of the scope of the CEIA	
<b>28 September (interested and general public)</b>	Identification of key findings (environmental impacts)	Consultation on the Report on the Determination of the Scope of the CEIA
	Definition of environmental objectives	
	Draft NEP proposal	
	Production of the preliminary Environmental Report for the Draft NEP proposal	
<b>November 2010, ministries and organisation included in the CEIA, depending on the content of the plan</b>	Detailed definition of NEP measures	Consultation on the draft NEP proposal

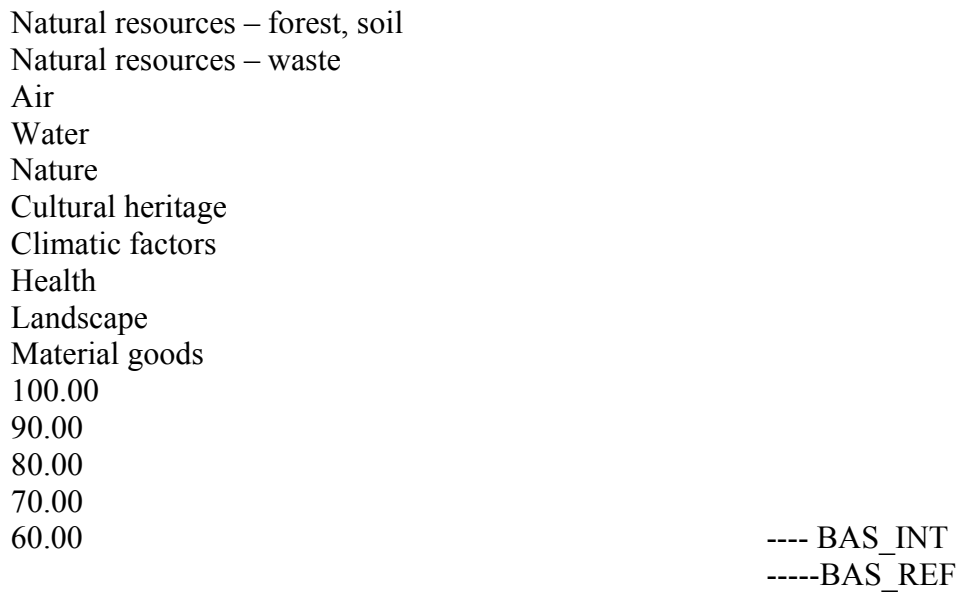
	Production of the Environmental Report and the NEP proposal	
May 2011	Public discussion on the Environmental Report and the NEP proposal	
	Completion of the NEP proposal	
	Completion of the Environmental Report	
	Consideration of the NEP proposal and its adoption by the Government of the Republic of Slovenia	

**Figure 5: Combination of NEP scenarios**

EXTERNAL CIRCUMSTANCES	International energy prices	IEA					
	Economic activity scenario	TARGET					
	Traffic policy	SUSTAINABLE TRAFFIC POLICY					
ENERGY POLICY	EUE, RES, CHP AND LE strategy	INTENSIVE				REFERENCE	
	Scenario for electricity generation on the transmission network	BASIC	NUCLEAR	GAS	NUCLEAR WITHOUT UNIT 6 OF THE ŠOŠTANJ THERMA POWER PLANT	GAS WITHOUT UNIT 6 OF THE ŠOŠTANJ THERMA POWER PLANT	BASIC

**Figure 6: Presentation of the assessment of environmental impacts of NEP scenarios  
Comparison of basic scenarios**

(in percentages with respect to the highest grade awarded to an impact)



**Figure 7: Relationship between environmental objectives and indicators**

	Environmental objectives	Objectives stipulated in other plans or programmes
	Environmental indicators and target values	Other indicators and target values
Initial state	Forecasts	Monitoring

**Figure 8: The share of occurrence of individual valuable natural feature categories (Ministry of the Environment and Spatial Planning, 2010)**

- Valuable landscape features 0%
- Geomorphological valuable natural features 18%
- Subterranean geomorphological valuable natural features 2%
- Geological valuable natural features 7%
- Hydrological valuable natural features 19%
- Botanical valuable natural features 8%
- Zoological valuable natural features 8%
- Ecosystem valuable natural features 13%
- Arboreal valuable natural features 27%
- Formed valuable natural features 1%

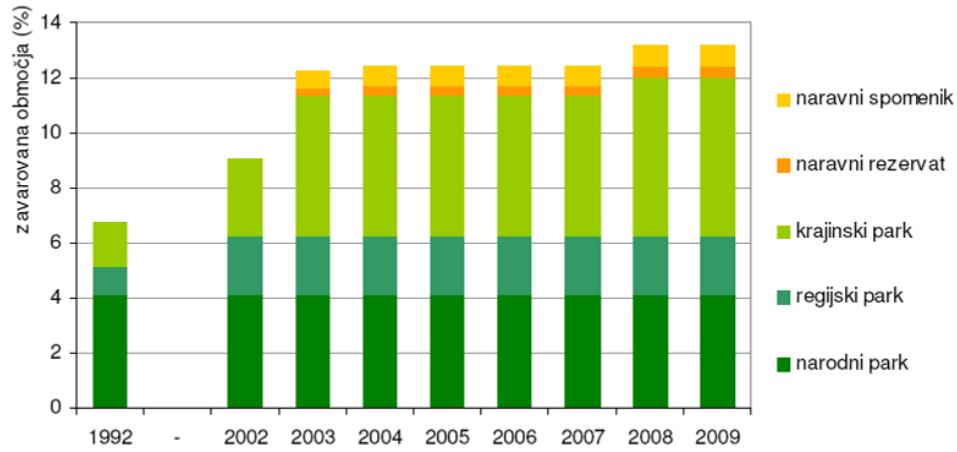


Figure 1: Proportion of protected areas by category (MESP, 2010) Natural monument, natural reserve, landscape park, regional park, national park

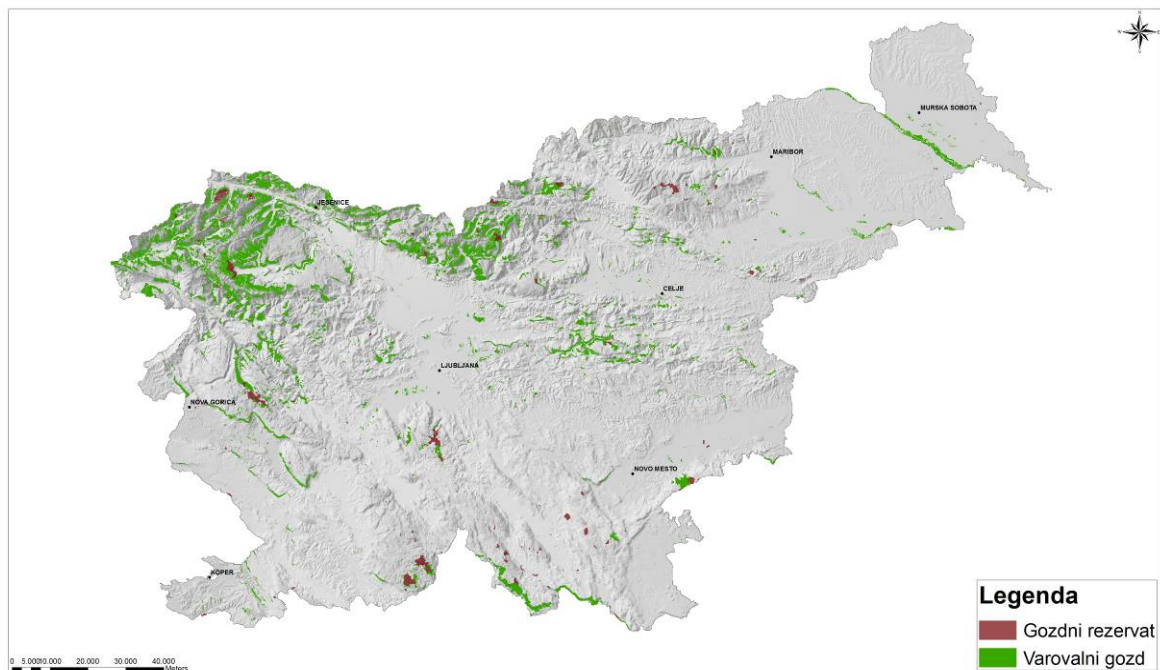
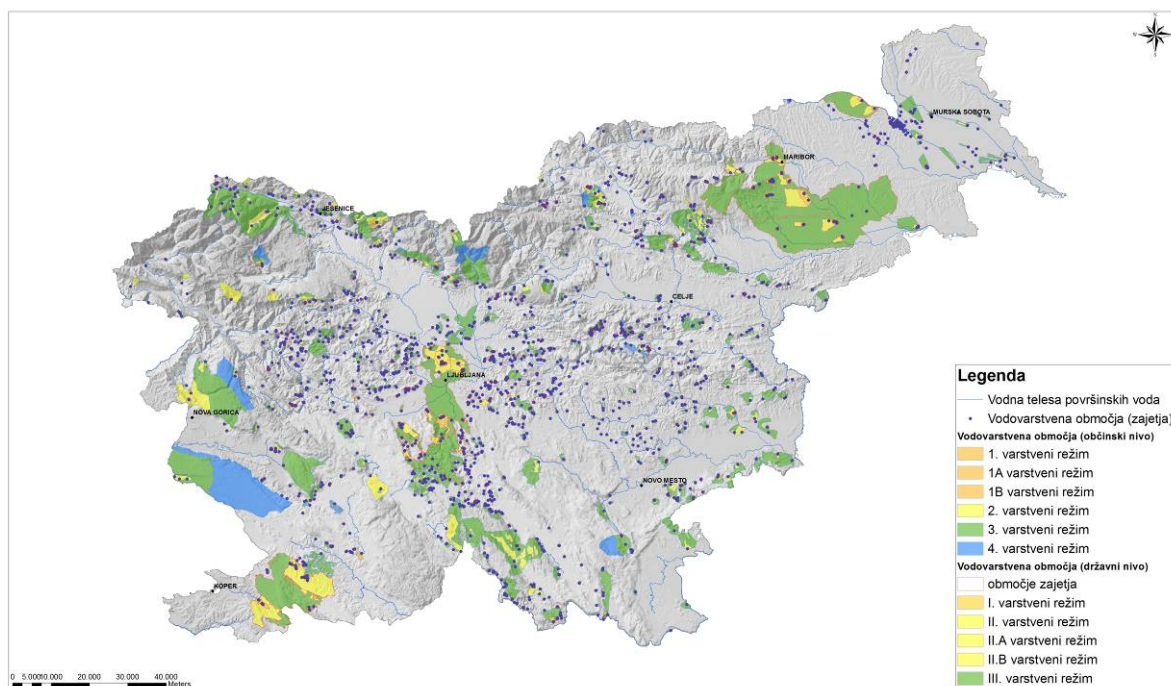


Figure 2: Forest reserves and protected forests (source of bases: Forest Service)

Legend:  
 Forest reserve  
 Protected forest



**Figure 3: Water protection areas (source of bases: ARSO)**

**Legend**

Water bodies of surface waters

Water protection areas (recovery sites)

Water protection areas (municipal level)

1st protection regime

1A protection regime

1B protection regime

2nd protection regime

3rd protection regime

4th protection regime

Water protection areas (state level)

Recovery area

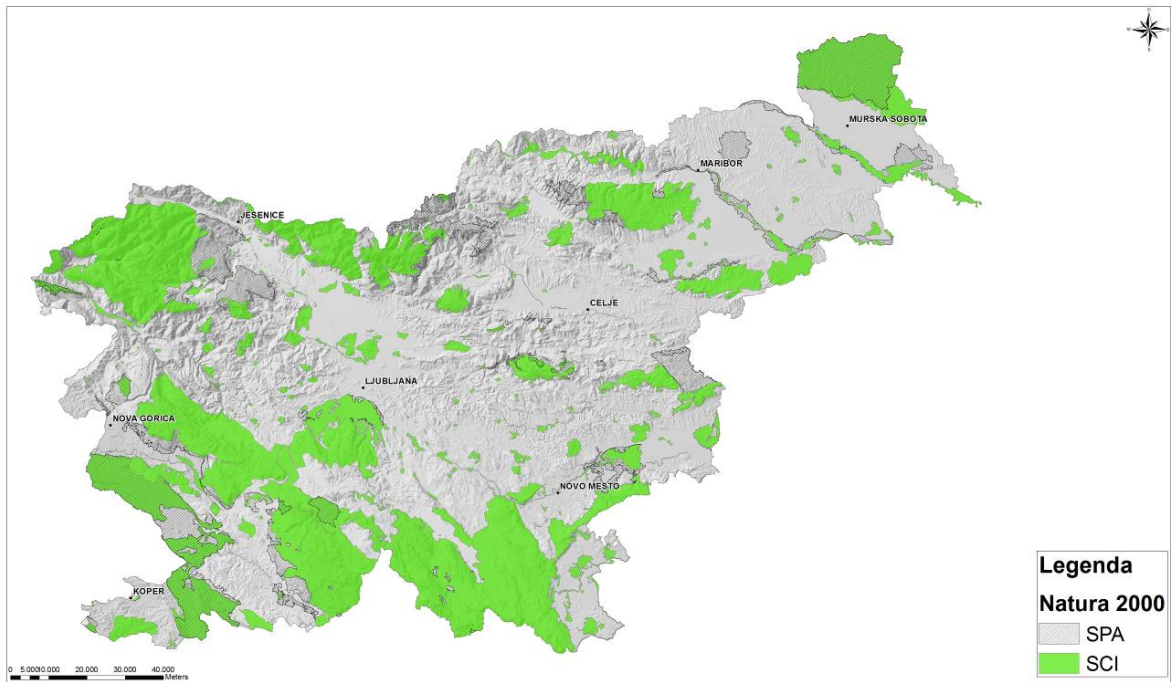
I protection regime

II protection regime

IIA protection regime

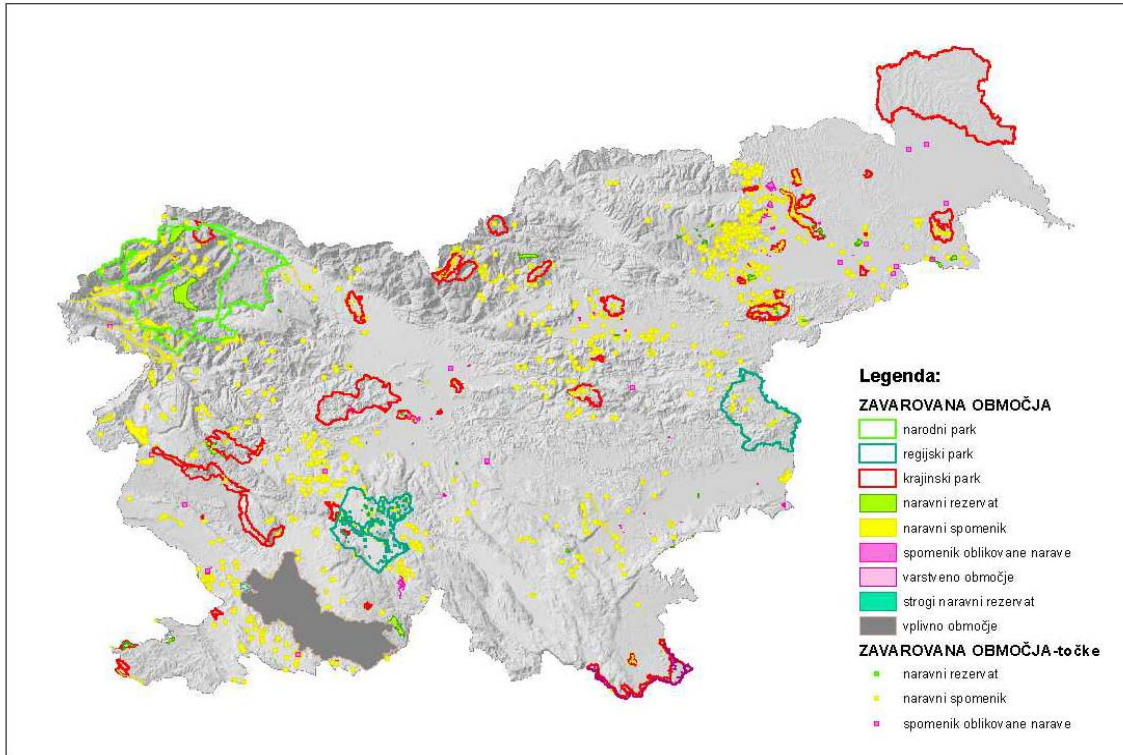
IIB protection regime

III protection regime



*Figure 4: Natura 2000 sites (source of bases: ARSO)*

Legend  
 Natura 2000  
 SPA  
 SCI



*Figure 5: Protected areas (source of bases: ARSO)*

Legend

PROTECTED AREAS

National park

Regional park

Landscape park

Nature reserve

Natural monument

Arranged natural monument

Protection area

Strict natural reserve

Impact area

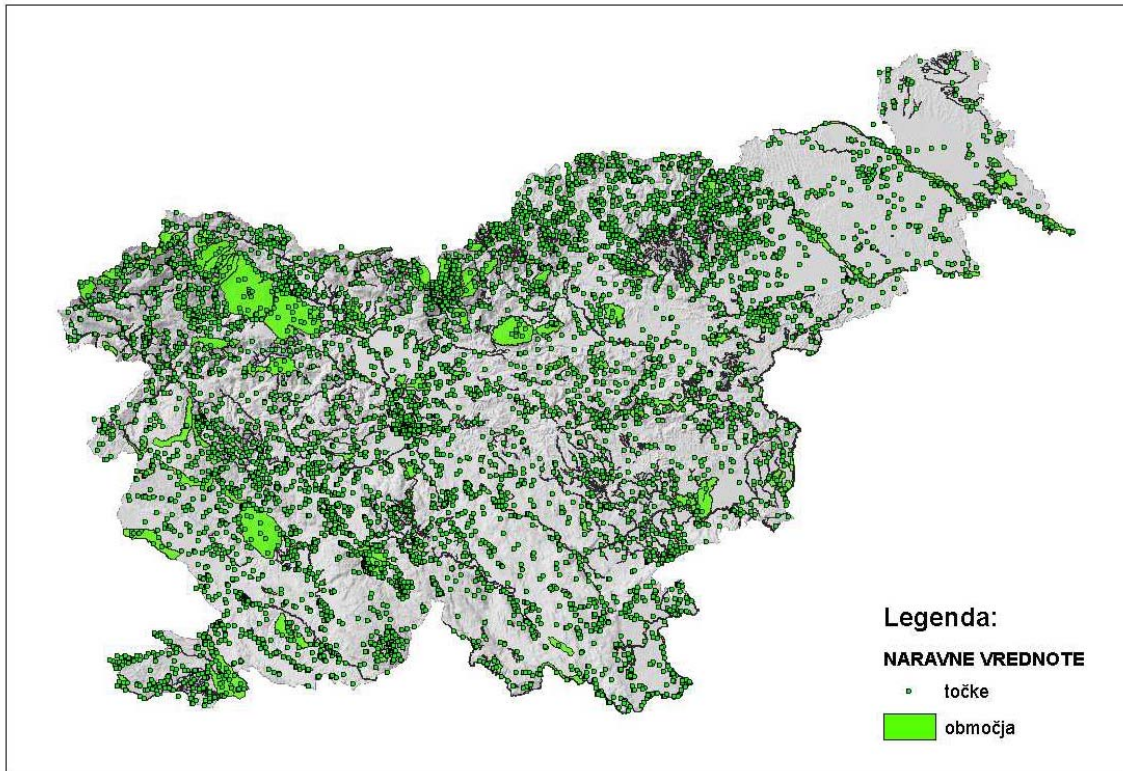
PROTECTED AREAS – points

Nature reserve

Natural monument

Arranged natural monument





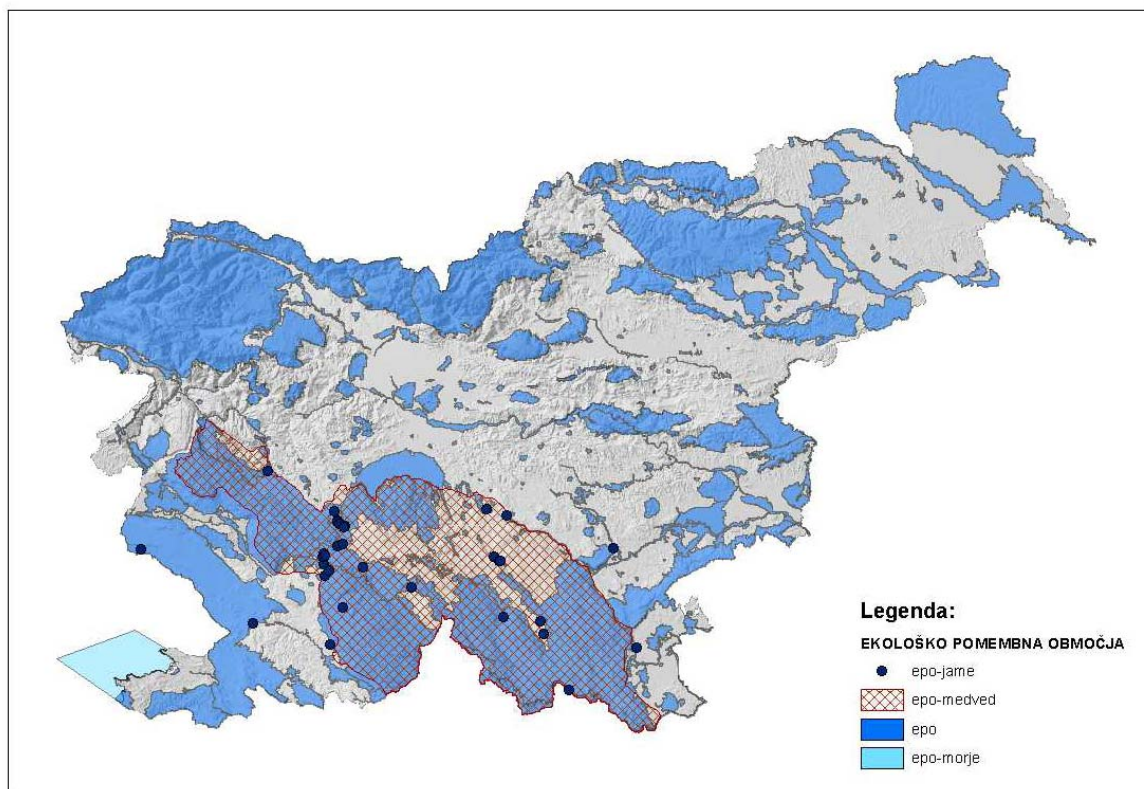
*Figure 6: Natural values (source of bases: ARSO)*

*Legend*

*NATURAL VALUES*

*Points*

*Areas*



*Figure7: Ecologically important areas (source of bases: ARSO)*

Legend:

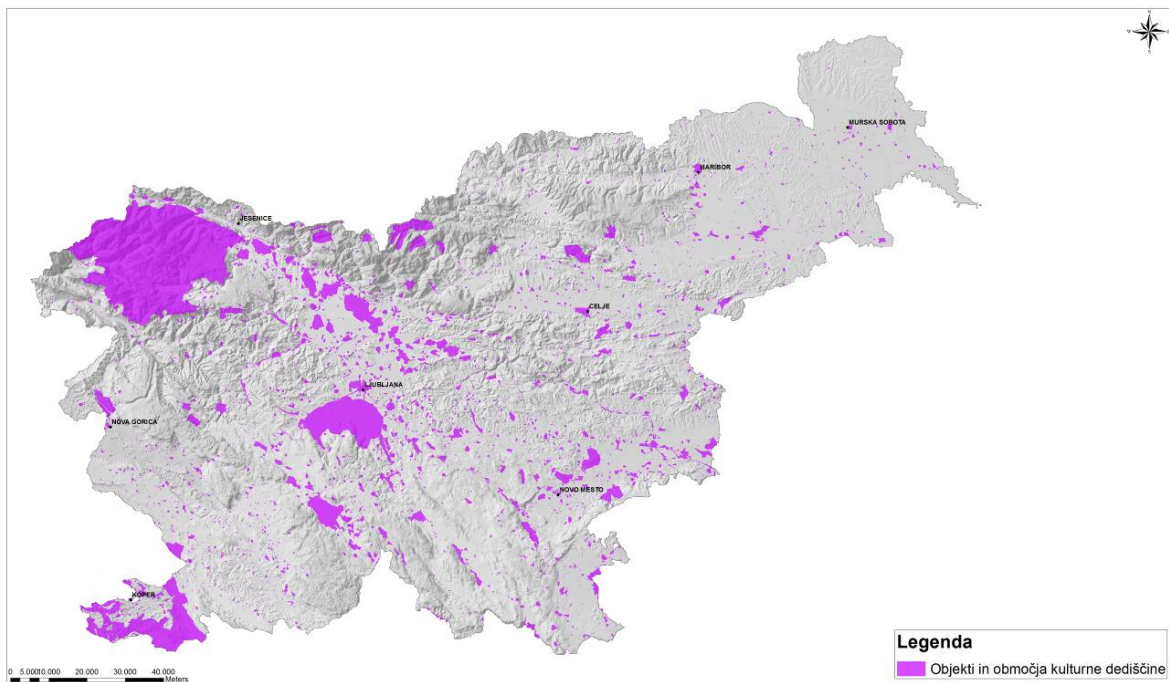
ECOLOGICALLY IMPORTANT AREAS

EIA – caves

EIA – bear

EIA

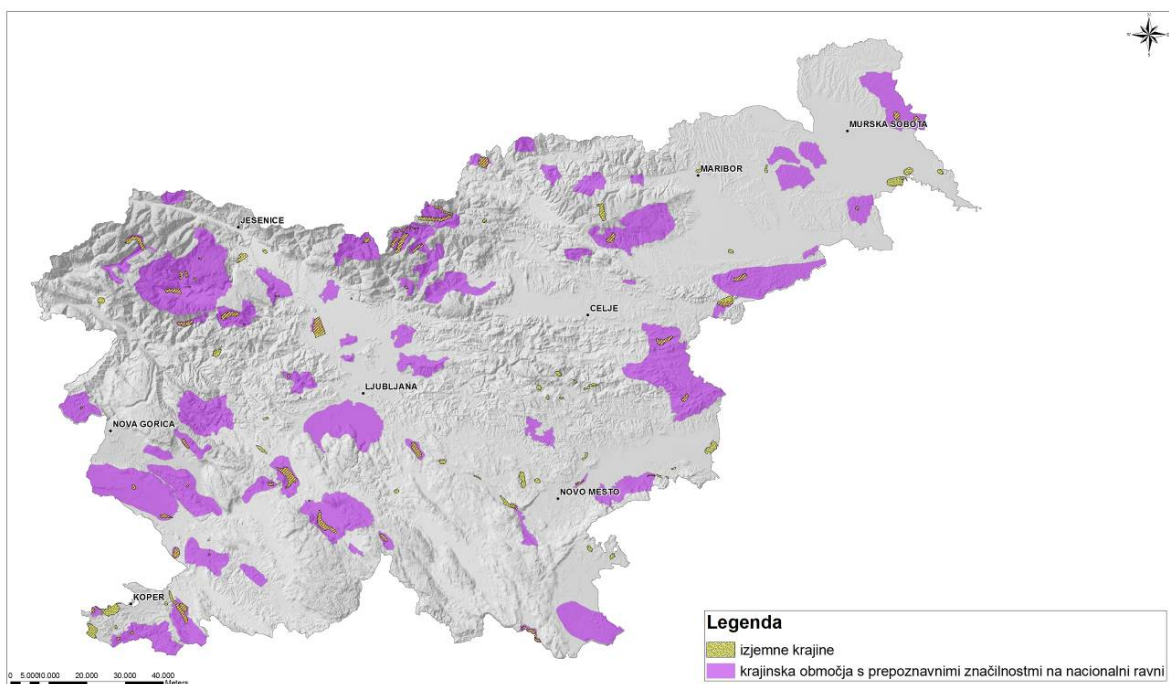
EIA – sea



*Figure 8: Facilities and areas of cultural heritage (source of bases: Register of Immovable Cultural Heritage (RKD), Ministry of Culture, status as per 24/8/2010)*

**Legend**

*Facilities and areas of cultural heritage*

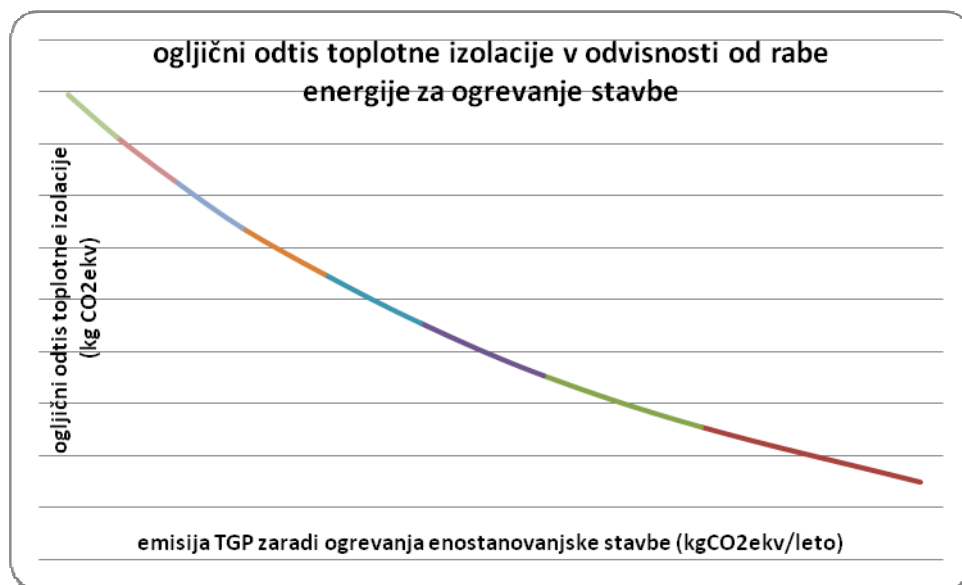


*Figure 9: Exceptional landscapes and landscape areas with distinctive characteristics at the national level (source of bases: SDSS 2004, MESP 2000)*

**Legend**

*Exceptional landscapes*

*Landscape areas with distinctive characteristics at the national level*



**Figure 10: Carbon footprint of thermal insulation of buildings (Frank Pedersen et al., 2008)**  
Carbon footprint of thermal insulation of buildings in relation to the energy use for building heating

(left side text) Carbon footprint of thermal insulation (kg CO2 ekV)

(bottom text) GHG emissions due to heating of the one-dwelling building

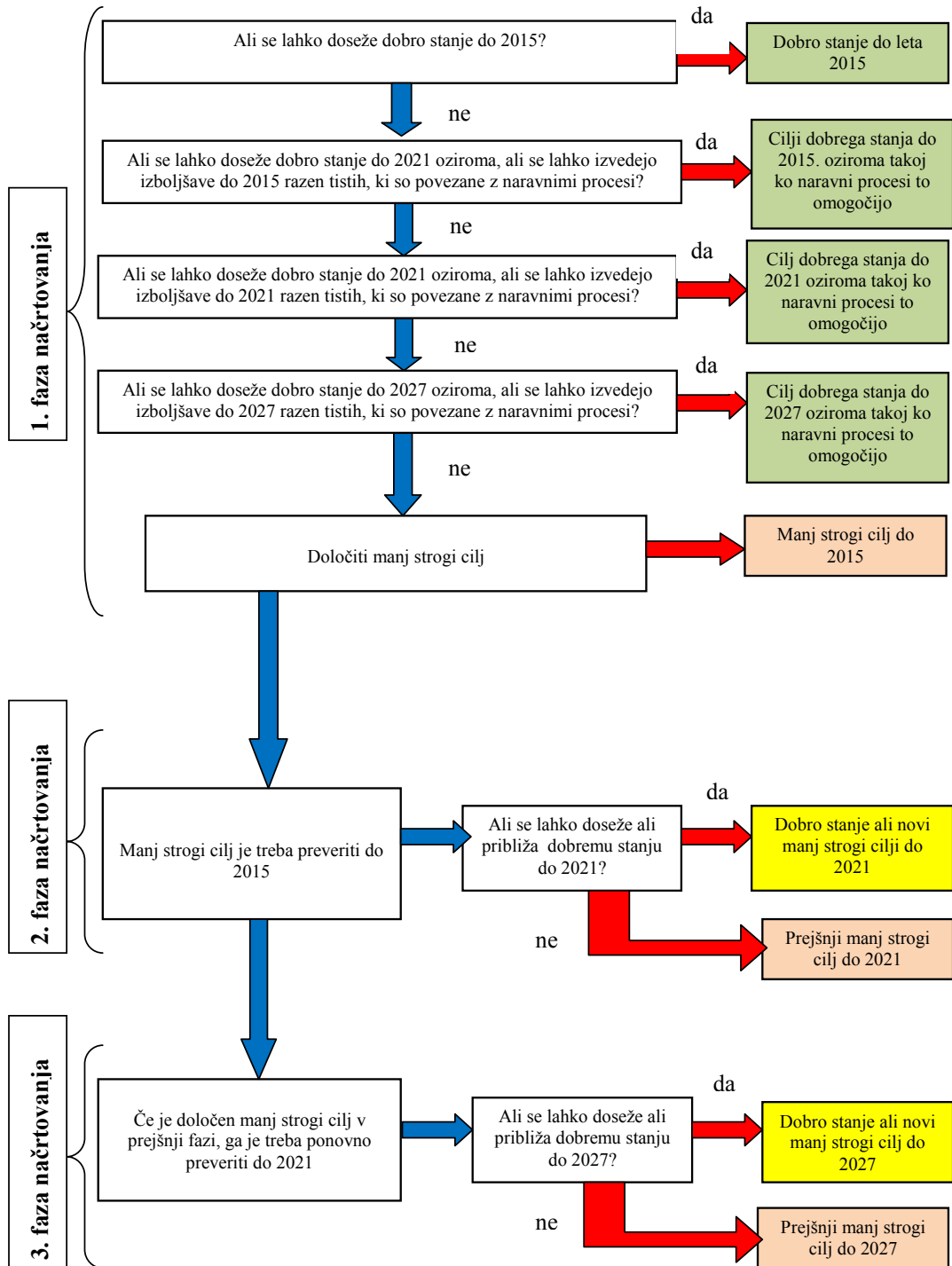


Figure 11: Use of exemptions under Article 4(4) and 4(5) of Directive 2000/60/EC

(From top down)

Is it possible to achieve a good status by 2015? No	Yes	Good status by 2015
Is it possible to achieve a good status by 2021 or can improvements be implemented by 2015 except for those related to natural processes? No	yes	Objectives of good status by 2015 or as soon as natural processes allow
Is it possible to achieve a good status by 2021 or can improvements be implemented by 2021 except for those related to natural processes? No	yes	Objectives of good status by 2021 or as soon as natural processes allow
Is it possible to achieve a good status by 2027 or can improvements be implemented by 2027 except for those related to natural processes? No	yes	Objectives of good status by 2027 or as soon as natural processes allow
Less stringent objective to be determined		Less stringent objective by 2015
Less stringent objective to be verified by 2015	Can it be reached or approximate to the good status by 2021?	yes Good status or less objectives by 2021
	No	Previous less stringent objective by 2021
If a less stringent objective is determined in the previous phase, it should be verified again until 2021	Can it reach or approximate to the good status by 2027?	yes Good status or less objectives by 2027
	No	Previous less stringent objective by 2027

(left side text, from top down)

- 1st planning phase
- 2nd planning phase
- 3rd planning phase



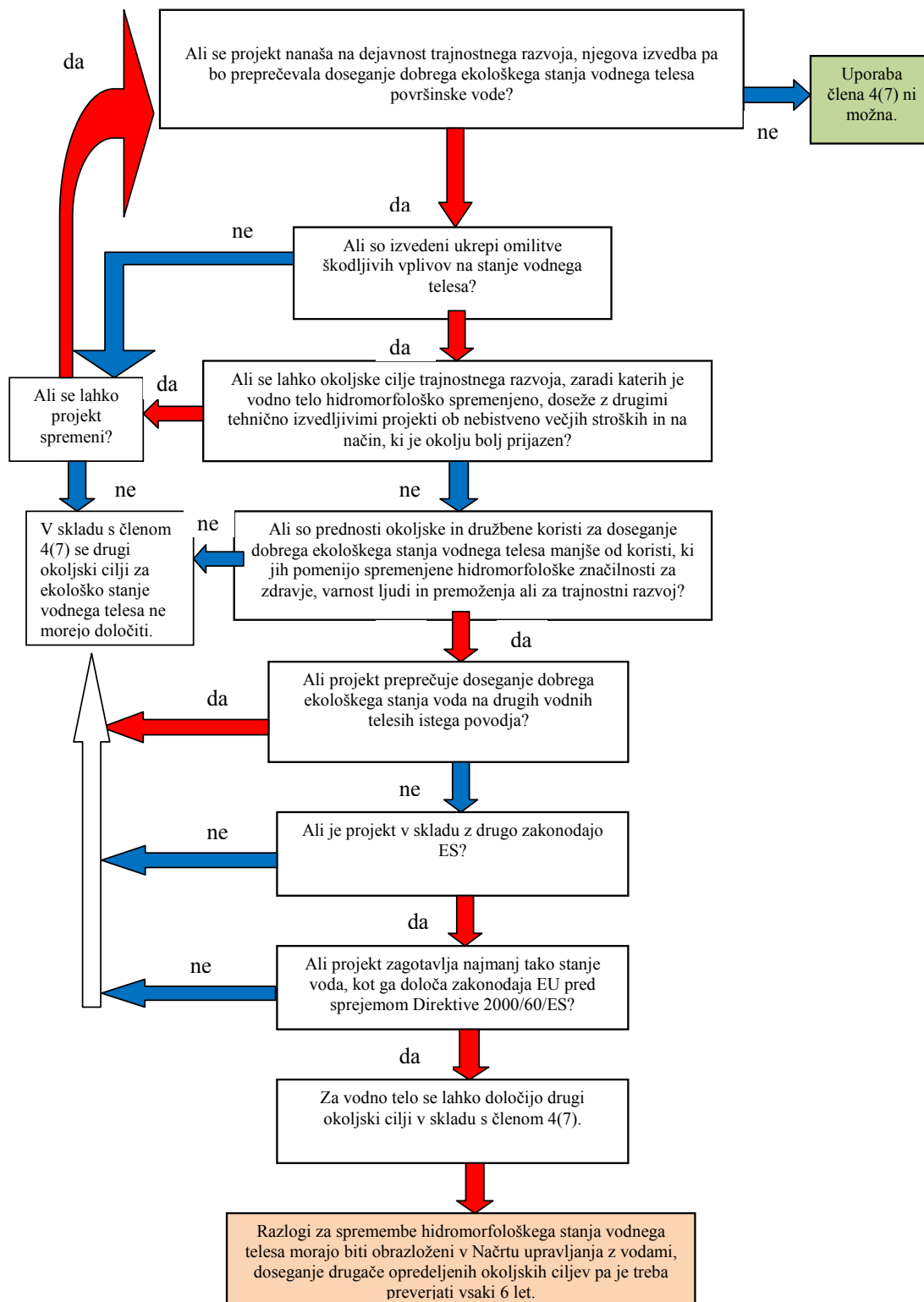


Figure 12: Process of determining exemptions under Article 4(7) of Directive 2000/60/EC

(from up to bottom)

Yes  
of

Does the project deal with sustainable development activities, but its implementation will prevent the achievement of a good ecological status of the water body of surface waters?

No  
Use

Article 4(7)  
not possible

Yes  
No

Are the mitigation measures for adverse impacts on the water body status implemented?

Yes  
Can the project be changed?

Yes  
Can the environmental objectives of sustainable development which cause hydro-morphological changes in the water body be achieved with other technically feasible projects at no remarkably higher costs in a more environment-friendly way?

No  
No  
No

According to Article 4(7) other environmental objectives body of for the ecological status by

Are the advantages, environmental and social benefits for achieving a good ecological status of water surface waters smaller than the advantages represented

of the water body cannot be defined. changed hydro-morphological characteristics for health, human safety, and assets for sustainable development?

Yes  
Yes

Does the project prevent the achievement of a good ecological status of waters on other water bodies of the same river basin?

No  
No

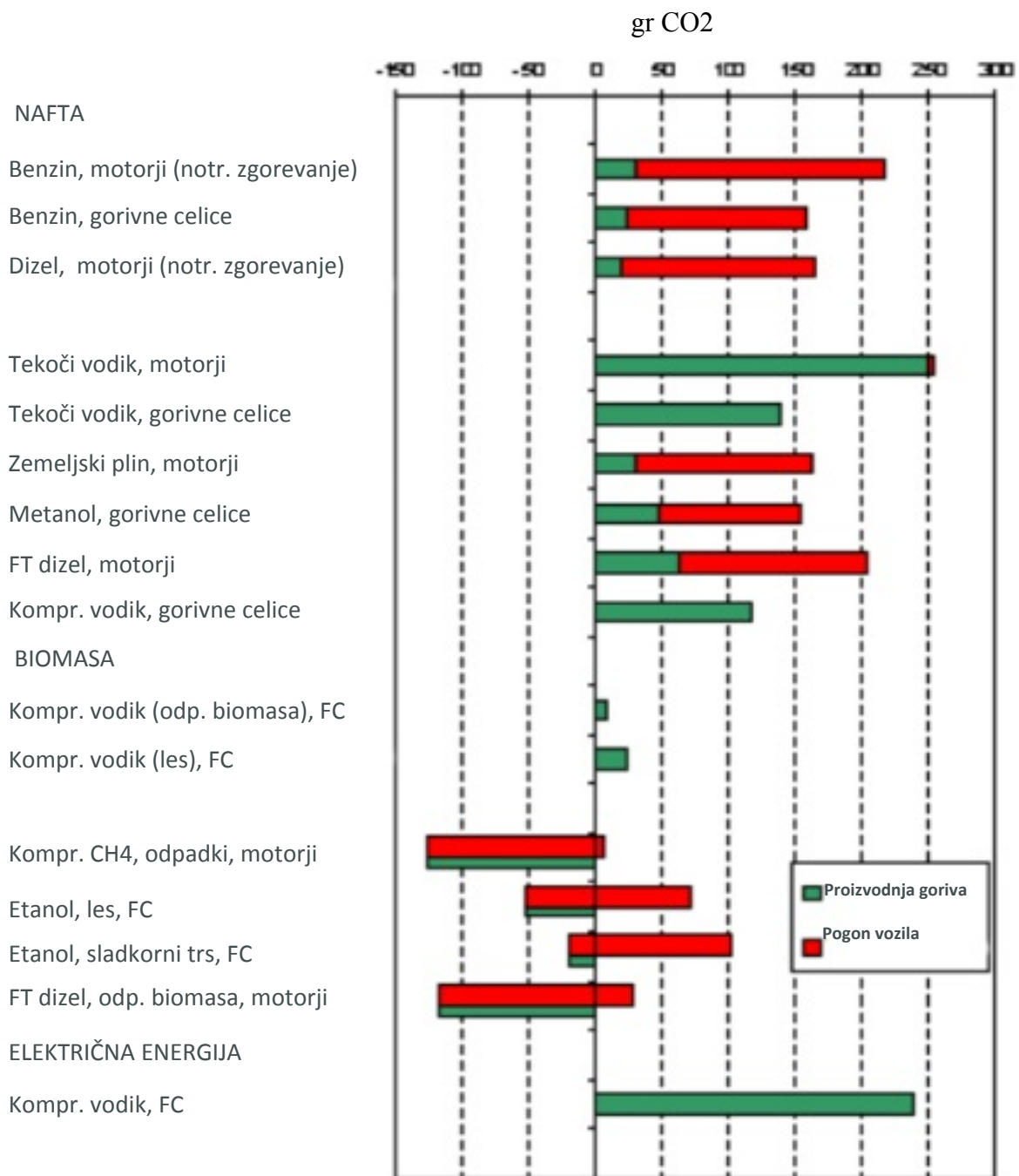
Does the project comply with other EU legislation?

No  
Yes

Does the project guarantee at least such water status as required by EU legislation before the adoption of Directive 2000/60/EC?

Yes  
Reasons for changes in the hydro-morphological status of a water body must be explained in a Water management plan, while the achievement of otherwise defined environmental objectives shall be verified every 6 years.





**Figure 13: GHG emissions for fuels of road vehicles in the entire lifetime**

## PETROLEUM

Gasoline, engines (internal combustion)

Gasoline, fuel cells

Diesel, engines (internal combustion)

Liquid hydrogen, engines

Liquid hydrogen, fuel cells

Natural gas, engines

Methanol, fuel cells

FT diesel, engines

Compressed hydrogen, fuel cells

## BIOMASS

Compressed hydrogen (waste biomass), FC

Compressed hydrogen (wood), FC

Compressed CH<sub>4</sub>, waste, engines

Ethanol, wood, FC

Ethanol, sugar cane, FC

FT diesel, waste biomass, engines

## ELECTRICITY

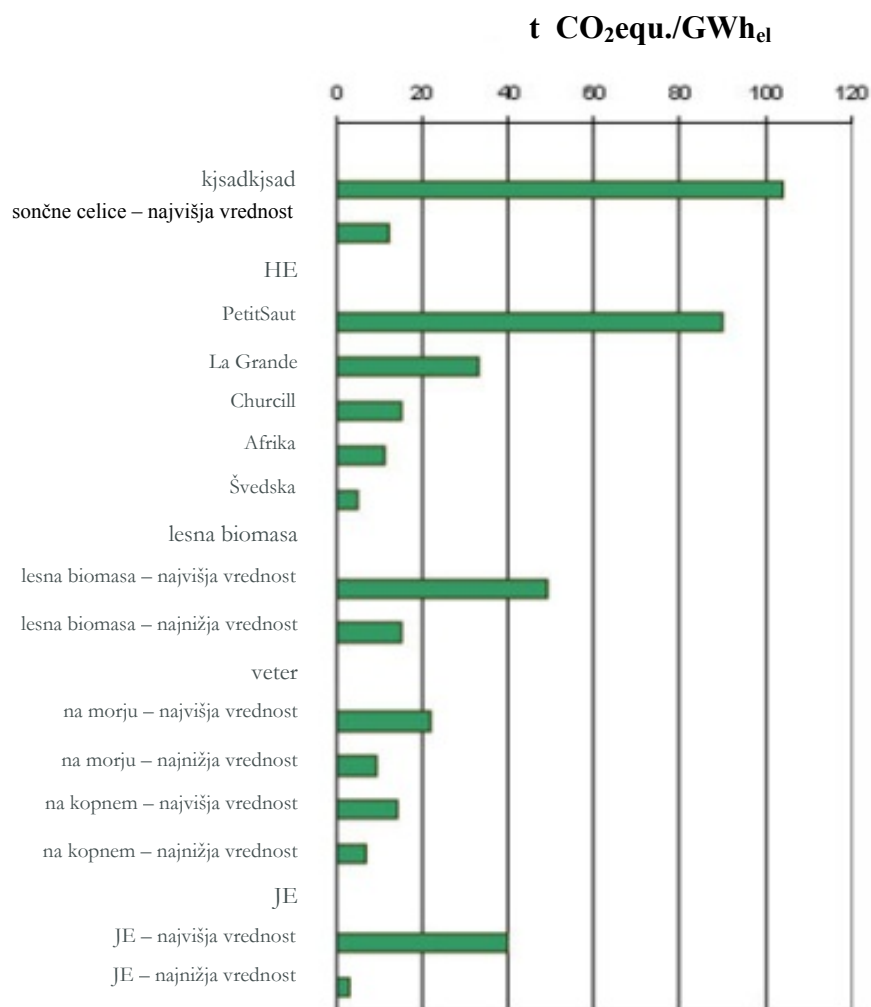
Compressed hydrogen, FC

(meaning of abbreviations: FC = fuel cell, conv.= conventional engine with internal combustion, FT diesel = diesel produced with the Fischer-Tropsch process)

(Legend, red and green)

Fuel production

Vehicle engine drive power



**Figure 14: GHG emissions throughout the lifetime of power plants using renewable energy sources and nuclear energy**

Kjsadkjsad

Solar panels – maximum value

HEP

Petit Saut

La Grande

Churchill

Africa

Sweden

Wood biomass

Wood biomass – maximum value

Wood biomass – minimum value

Wind

On sea – maximum value

On sea – minimum value

On land – maximum value

On land – minimum value

NPP

NPP – maximum value

NPP – minimum value

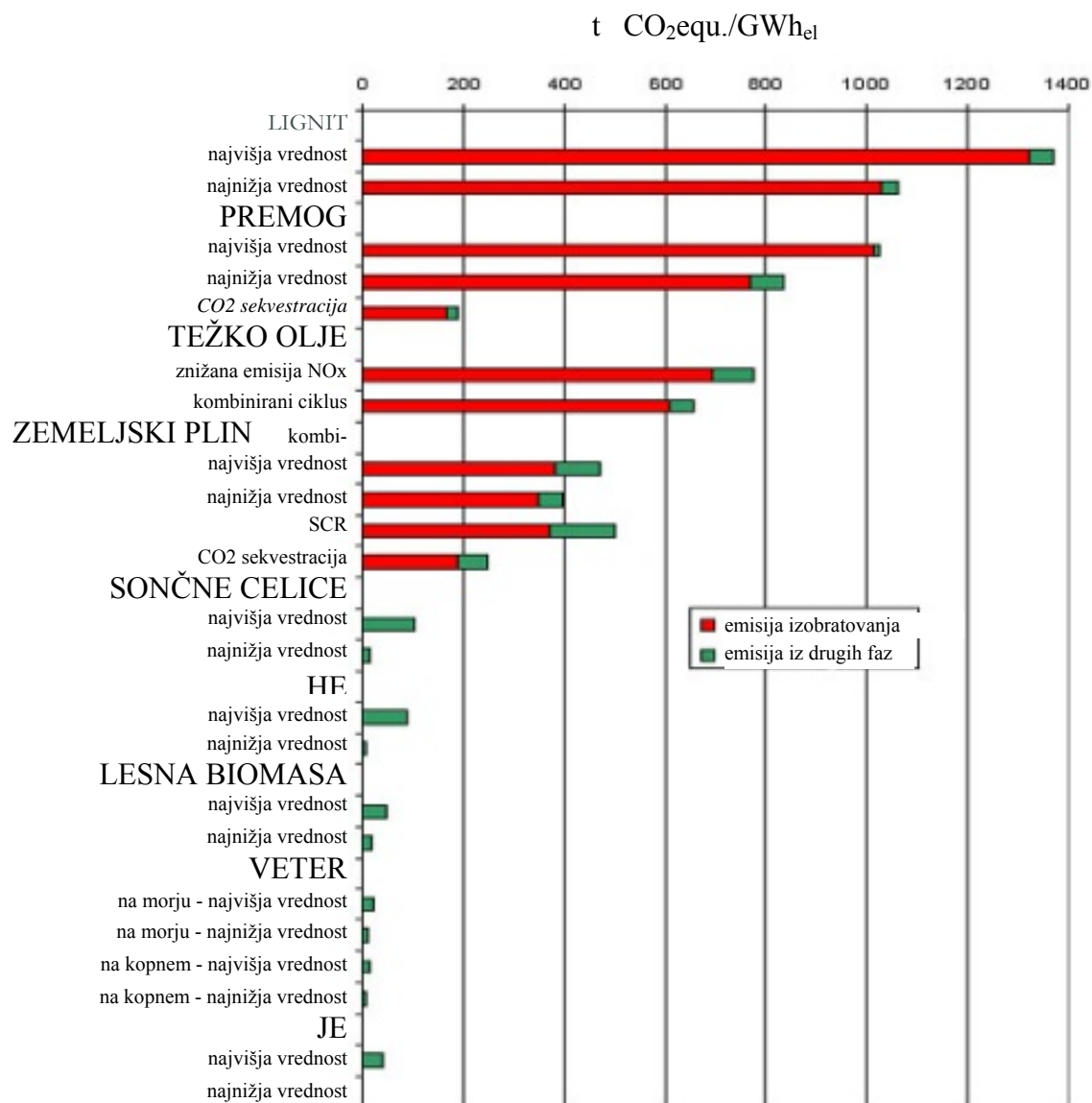


Figure 15: GHG emissions from different systems of electricity production

LIGNITE

Maximum value

Minimum value

COAL

Maximum value

Minimum value

CO<sub>2</sub> sequestration

HEAVY OIL

Lowered NO<sub>x</sub> emissions

Combined cycle

## NATURAL GAS

Combined cycle

Maximum value

Minimum value

SCR

CO2 sequestration

## SOLAR PANELS

Maximum value

Minimum value

## HEP

Maximum value

Minimum value

## WOOD BIOMASS

Maximum value

Minimum value

## WIND

On sea – maximum value

On sea – minimum value

On land – maximum value

On land – minimum value

## NPP

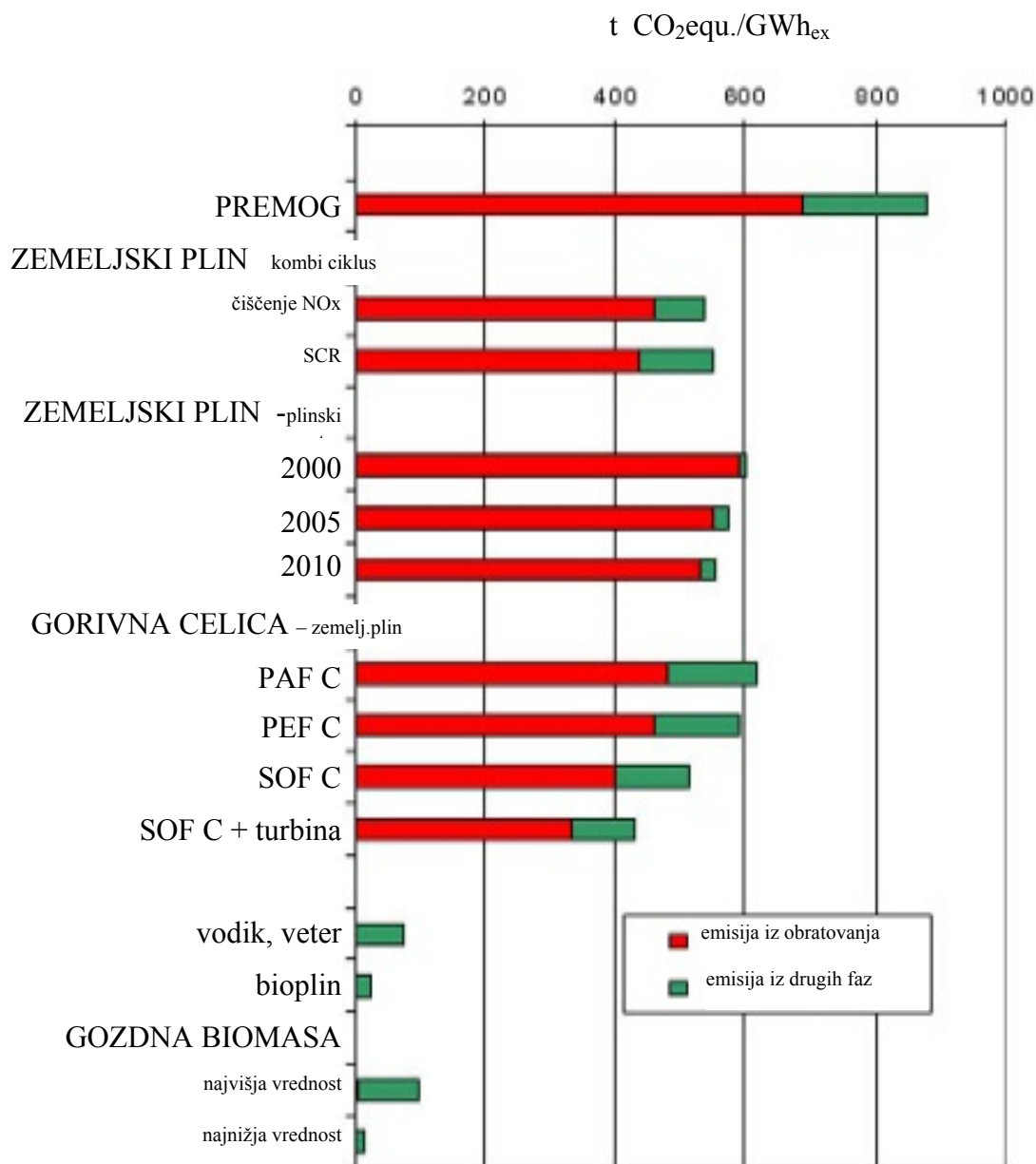
Maximum value

Minimum value

(legend, green and red)

Emissions from operation

Emissions from other phases



(meaning of expressions: ex= energy or available energy from CHP)

**Figure 16: Carbon footprint of electricity generation in CHP**

COAL

NATURAL GAS combined cycle

NOx cleaning

NATURAL GAS gas engine

FUEL CELL natural gas

SOF C + turbine

Hydrogen, wind

Biogas

FOREST BIOMASS

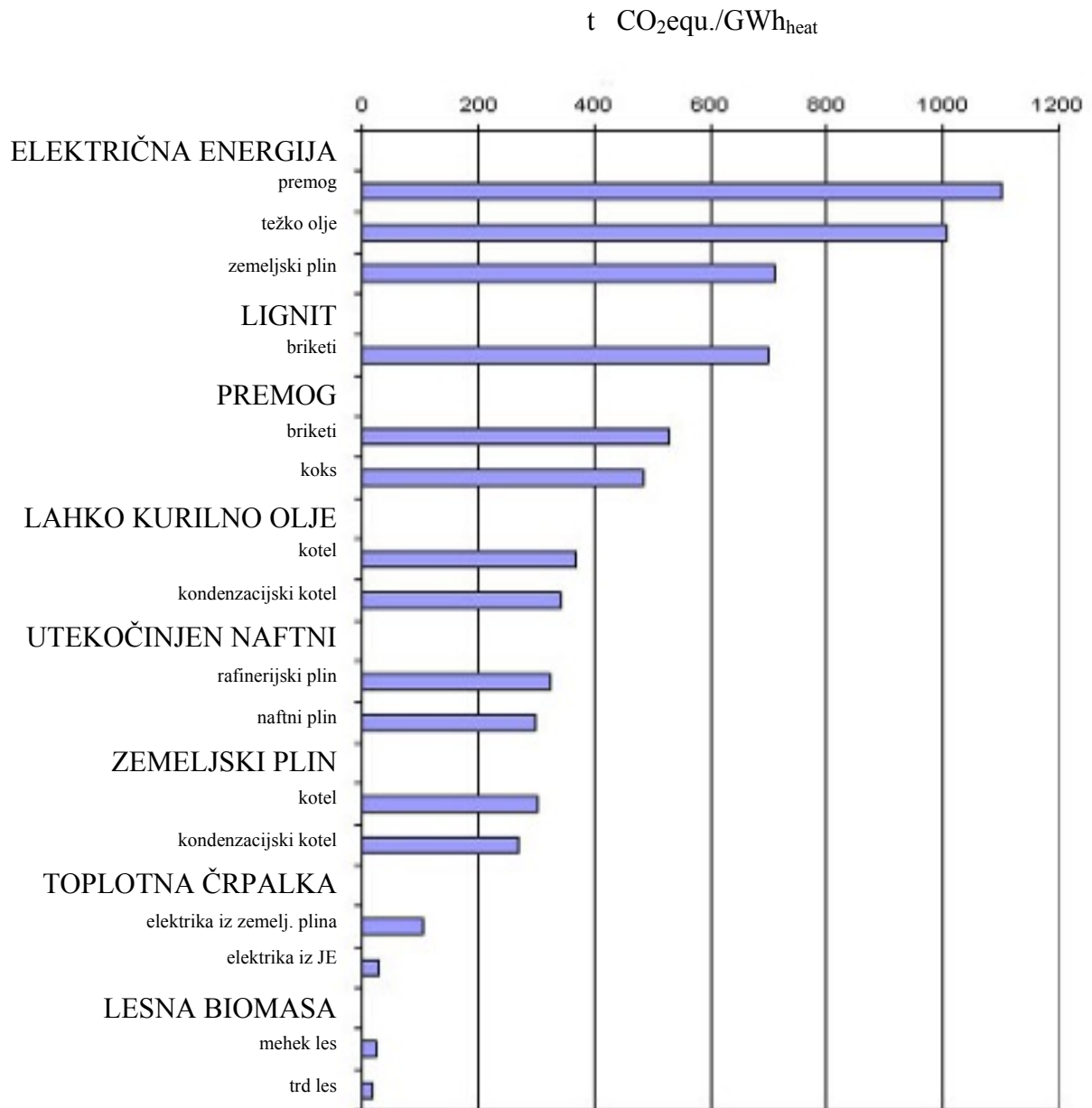
Maximum value

Minimum value

(legend, green and red)

Emissions from operation

Emissions from other phases



**Figure 17: Carbon footprints of heat production in terms of energy source**

**ELECTRICITY**

- Coal
- Heavy oil
- Natural gas

**LIGNITE**

- Briquettes

**COAL**

- Briquettes
- Coke

## HEATING GAS OIL

Boiler

Condensation boiler

## LIQUEFIED PETROLEUM GAS

Refinery gas

Petroleum gas

## NATURAL GAS

Boiler

Condensation boiler

## HEAT PUMP

Electricity from natural gas

Electricity from NPP

## WOOD BIOMASS

Soft wood

Hard wood

Figure 31:

use of fuels

annual SO<sub>2</sub> emissions

BAS\_REF (OSN\_REF)

NPP\_REF (JE\_REF)

GAS\_REF (PLIN\_REF)

BAS\_INT (OSN\_INT)

NPP\_INT (JE\_INT)

GAS\_INT (PLIN\_INT)

DOD\_GAS (DOD\_PLIN)

DOD\_NPP (DOD\_JE)

million tonnes

year

use of fuels

annual NO<sub>x</sub> emissions

BAS\_REF (OSN\_REF)

NPP\_REF (JE\_REF)

GAS\_REF (PLIN\_REF)

BAS\_INT (OSN\_INT)

NPP\_INT (JE\_INT)

GAS\_INT (PLIN\_INT)

DOD\_GAS (DOD\_PLIN)

DOD\_NPP (DOD\_JE)

million tonnes



year

use of fuels

annual emissions of particles

BAS\_REF (OSN\_REF)

NPP\_REF (JE\_REF)

GAS\_REF (PLIN\_REF)

BAS\_INT (OSN\_INT)

NPP\_INT (JE\_INT)

GAS\_INT (PLIN\_INT)

DOD\_GAS (DOD\_PLIN)

DOD\_NPP (DOD\_JE)

million tonnes

year

Table 44:

Scenario BAS\_INT (OSN\_INT)

natural resources

water

nature

cultural heritage

health

landscape

material assets

SUB-PROGRAMME

character

scope

total

SUB-PROGRAMME EVALUATION

EVALUATION OF A GROUP OF MEASURES

EVALUATION OF MEASURES

1. EFFICIENT USE OF ENERGY

2. USE OF ENERGY IN TRANSPORT

3. RENEWABLE SOURCES OF ENERGY

3.1 micro, small and medium-sized power plants

3.1.1 wind farms

3.1.2 small HPPs

3.1.3 solar power plants

3.1.4 geothermal power plants

3.1.5 CHP on WB

3.1.6 landfill gas, other bio gases and water treatment plants

3.2 heating systems using RES

3.2.1 geothermal heating systems

3.2.2 solar thermal collectors

- 3.2.3 heating systems on wood biomass (WB)
- 3.2.4 heat pumps
- 4. LOCAL ENERGY SUPPLY
- 5. CHP ON NATURAL GAS
- 6. GENERATION OF ELECTRICITY
  - 6.1 generation of electricity by way of fossil fuels
  - 6.2 generation of electricity in HPPs
  - 6.3 use of WB in large CHP units with a high utilisation rate
  - 6.4 generation of electricity from nuclear energy
- 7. TRANSMISSION OF ELECTRICITY
- 8. DISTRIBUTION OF ELECTRICITY
- 9. NATURAL GAS SUPPLY
- 10. LIQUID FUELS
- TOTAL
- SCENARIO TOTAL

Table 45:

SCENARIO : INT\_NPP (INT\_JE)

natural resources

water

nature

cultural heritage

health

landscape

material assets

SUB-PROGRAMME

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Table 46:

SCENARIO : INT\_GAS (INT\_PLIN)

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water

nature

cultural heritage

health

landscape

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Table 47:

SCENARIO: REF\_BAS (REF\_OSN)

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nature

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Table 48:

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Table 49:

SCENARIO: REF\_GAS (REF\_PLIN)

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Table 50:

SCENARIO : ADD\_GAS (DOD\_PLIN)

natural resources

water

nature

cultural heritage

health

landscape

material assets

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3.1.5 CHP on WB	
3.1.6 landfill gas, other bio gases and water treatment plants	
3.2 heating systems using RES	
3.2.1 geothermal heating systems	
3.2.2 solar thermal collectors	
3.2.3 heating systems on wood biomass (WB)	
3.2.4 heat pumps	
4. LOCAL ENERGY SUPPLY	
5. CHP ON NATURAL GAS	
6. GENERATION OF ELECTRICITY	
6.1 generation of electricity by way of fossil fuels	
6.2 generation of electricity in HPPs	
6.3 use of WB in large CHP units with a high utilisation rate	
6.4 generation of electricity from nuclear energy	
7. TRANSMISSION OF ELECTRICITY	
8. DISTRIBUTION OF ELECTRICITY	
9. NATURAL GAS SUPPLY	
10. LIQUID FUELS	
TOTAL	
SCENARIO TOTAL	

Table 51:

SCENARIO : ADD\_NPP (DOD\_JE)

natural resources

water

nature

cultural heritage

health

landscape

material assets

SUB-PROGRAMME

character

scope

total

SUB-PROGRAMME EVALUATION

EVALUATION OF GROUP OF MEASURES



## EVALUATION OF MEASURES

### 1. EFFICIENT USE OF ENERGY

### 2. USE OF ENERGY IN TRANSPORT

### 3. RENEWABLE SOURCES OF ENERGY

#### 3.1 micro, small and medium-sized power plants

##### 3.1.1 wind farms

##### 3.1.2 small HPPs

##### 3.1.3 solar power plants

##### 3.1.4 geothermal power plants

##### 3.1.5 CHP on WB

##### 3.1.6 landfill gas, other bio gases and water treatment plants

#### 3.2 heating systems using RES

##### 3.2.1 geothermal heating systems

##### 3.2.2 solar thermal collectors

##### 3.2.3 heating systems on wood biomass (WB)

##### 3.2.4 heat pumps

### 4. LOCAL ENERGY SUPPLY

### 5. CHP ON NATURAL GAS

### 6. GENERATION OF ELECTRICITY

#### 6.1 generation of electricity by way of fossil fuels

#### 6.2 generation of electricity in HPPs

#### 6.3 use of WB in large CHP units with a high utilisation rate

#### 6.4 generation of electricity from nuclear energy

### 7. TRANSMISSION OF ELECTRICITY

### 8. DISTRIBUTION OF ELECTRICITY

### 9. NATURAL GAS SUPPLY

### 10. LIQUID FUELS

### TOTAL

### SCENARIO TOTAL

Table 52:

type of impact

values according to the significance of the impact and the marginal external cost

unit

BAS\_INT (OSN\_INT)

NPP\_INT (JE\_INT)

GAS\_INT (PLIN\_INT)

BAS\_REF (OSN\_REF)

NPP\_REF (JE\_REF)

GAS\_REF (PLIN\_REF)

ADD\_GAS (DOD\_PLIN)

ADD\_NPP (DOD\_JE)

natural resources – forest, soil

natural resources - waste  
air  
water  
nature  
cultural heritage  
climatic factors  
health  
material assets  
no. of points  
million €

Table 53:

type of impact  
normalised evaluation values (in % of the maximum value)  
unit  
BAS\_INT (OSN\_INT)  
NPP\_INT (JE\_INT)  
GAS\_INT (PLIN\_INT)  
BAS\_REF (OSN\_REF)  
NPP\_REF (JE\_REF)  
GAS\_REF (PLIN\_REF)  
ADD\_GAS (DOD\_PLIN)  
ADD\_NPP (DOD\_JE)  
natural resources – forest, soil  
natural resources - waste  
air  
water  
nature  
cultural heritage  
climatic factors  
health  
material assets

Figure 32:

all intensive scenarios  
(in percentages according to the maximum grade of impact)  
natural resources – forest, soil  
material assets  
natural resources - waste  
landscape  
air  
health  
water

climatic factors  
nature  
cultural heritage  
BAS\_INT (OSN\_INT)  
NPP\_INT (JE\_INT)  
GAS\_INT (PLIN\_INT)

Figure 33:

all reference scenarios  
(in percentages according to the maximum grade of impact)  
natural resources – forest, soil  
material assets  
natural resources - waste  
landscape  
air  
health  
water  
climatic factors  
nature  
cultural heritage  
BAS\_REF (OSN\_REF)  
NPP\_REF (JE\_REF)  
GAS\_REF (PLIN\_REF)

Figure 34:

comparison of basic scenarios  
(in percentages according to the maximum grade of impact)  
natural resources – forest, soil  
material assets  
natural resources - waste  
landscape  
air  
health  
water  
climatic factors  
nature  
cultural heritage  
BAS\_INT (OSN\_INT)  
BAS\_REF (OSN\_REF)

Figure 35:

comparison of ADD\_GAS and ADD\_NPP scenarios  
(in percentages according to the maximum grade of impact)

natural resources – forest, soil

material assets

natural resources - waste

landscape

air

health

water

climatic factors

nature

cultural heritage

ADD\_GAS (DOD\_PLIN)

ADD\_NPP (DOD\_JE)