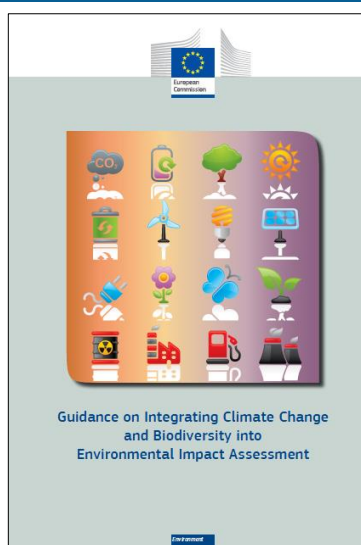
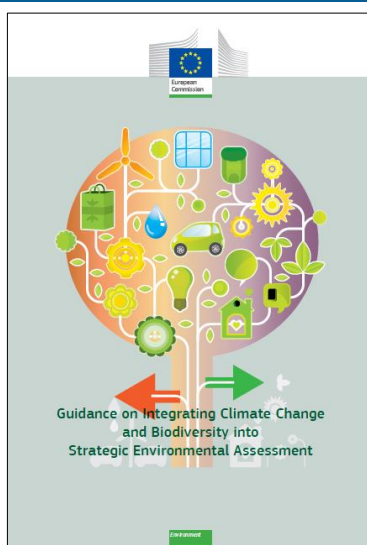


# EC guidance on Considering climate change adaptation concerns within SEA/EIA processes

Jiří Dusík



## Guidance documents



## Key challenges when considering climate change

Challenge	Approach
Long-term and cumulative impacts	Avoid “snapshot” analyses and consider trends both with and without the proposed development.
Complexity of cause-effect relationships	Work with both worst-case and best-case scenarios.
Uncertainty	Acknowledge assumptions and the limitations of current knowledge. Prepare for adaptive management.



## 1. Identification of key issues of concern

- Do NOT consider historic situations but CC scenarios
- Consider whether the climatic factors may affect the environmental concerns such as:
  - *Floods and droughts*
  - *Water quality*
  - *Soil and desertification*
  - *Forest fires*
  - *Etc.*



## Case: 6<sup>th</sup> Railroad corridor Zilina-Cierna (260 km)

Key issues:

- Floods
- Torrents
- Slope instability
- Avalanches
- Ice spells



### SPUO VIŠEGODIŠNJEG PROGRAMA GRADNJE KOMUNALNIH VODNIH GRAĐEVINA ZA RAZDOBLJE 2013. – 2023.

Cilj	Tehnički aspekti
- Povećanje stupnja priključenosti stanovništva na sustav vodoopskrbe	- Izgradnja sustava vodoopskrbe - Priključivanje stanovništva na sustav
- Osiguranje pitke vode za stanovništvo u skladu s higijensko-sanitarnim standardima.	- Obrada pitke vode u skladu s važećom zakonskom regulativom
- Povećanje stupnja priključenosti stanovništva na sustave javne odvodnje i pročišćavanja.	- Izgradnja sustava odvodnje otpadnih voda
- Pročišćavanje komunalnih i industrijskih otpadnih voda prije njihovog konačnog ispuštanja u recipijente.	- Izgradnja uređaja za pročišćavanje otpadnih voda s odgovarajućim stupnjem pročišćavanja

Scoping - **provedba Programa**, zbog njegove tematike, **neće značajno utjecati na klimatske promjene**. Ali istovremeno postoji **moгуćnost negativnih utjecaja klimatskih promjena na samu provedbu Programa**.



## 2. Analyzing baseline trends

- What is the trend so far and the current status?
- Why it evolves as it does? What is driving it?
- How is the baseline trend expected to evolve without the implementation of the proposed development – considering also changing climatic conditions?
- *What problems can be expected?*



## Future trends without the proposed PP can be outlined...

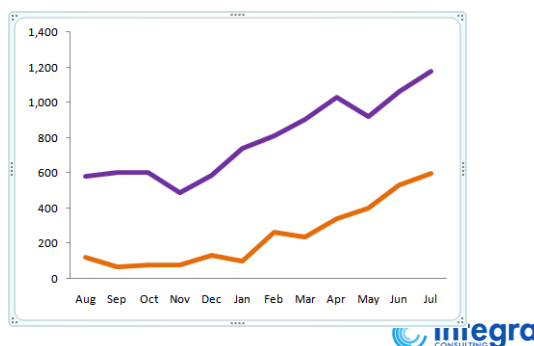
- Using terms such as “strongly suspected” or “suspected” (e.g. IPCC 2007).
- Through the best-case and worst-case scenarios illustrating possible extremes that may reasonably occur under different plausible assumptions.
- Semi-qualitatively: e.g. “trend may grow but it is unlikely to exceed a certain limit”



## Trend analyses

Story-lines that describe overall trends, their main drivers, territorial dimensions and key concerns and opportunities arising from them

Simple or complex graphs illustrating the relationship between drivers of trend and sometimes delayed changes in the environment over time



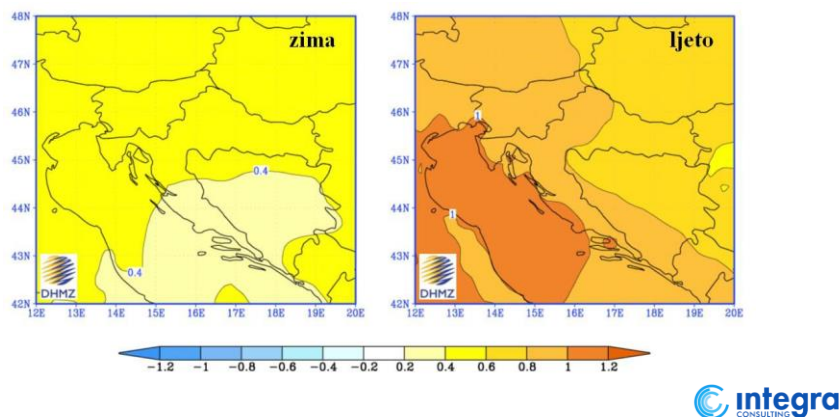
## Case: 6<sup>th</sup> Railroad corridor Zilina-Cierna (260 km)

Baseline:

- Review of risks on the existing corridor
- 13 areas problematic because of floods, torrents and unstable slopes
- + new issue of land-slides because of uphill deforestation identified
- Flood maps for Q1000 and maps of unstable areas
- CC scenarios for summer and winter rainfall (landslides and avalanches) – unable to find

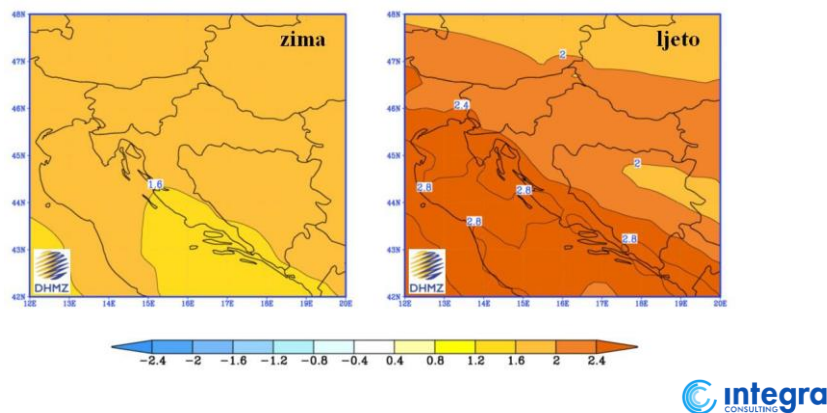
## SPUO VIŠEGODIŠNJEG PROGRAMA GRADNJE KOMUNALNIH VODNIH GRAĐEVINA ZA RAZDOBLJE 2013. – 2023.

**Promjena prizemne temperature zraka (u °C) u Hrvatskoj u razdoblju 2011. - 2040.** u odnosu na razdoblje 1961. - 1990. prema rezultatima srednjaka ansambla regionalnog klimatskog modela Reg CM za emisije plinova staklenika za zimu (lijevo) i ljeto (desno)



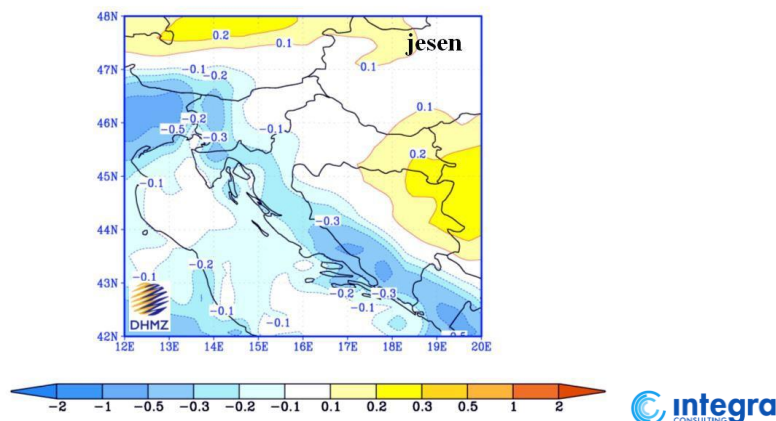
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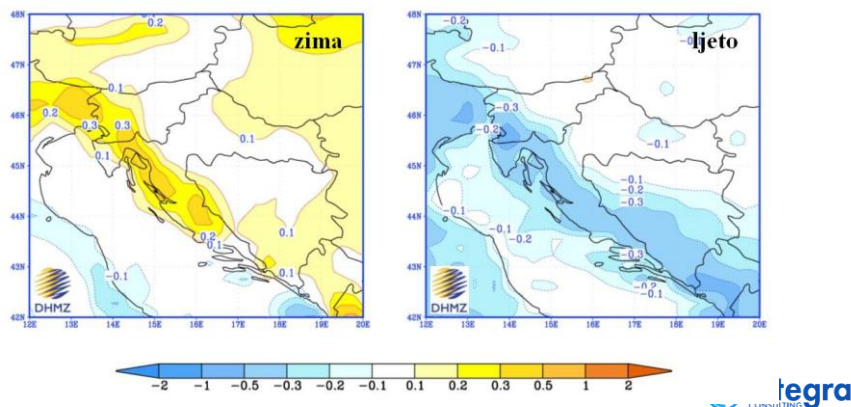
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**Promjena oborine u Hrvatskoj (u mm/dan) u razdoblju 2011. - 2040. u odnosu na razdoblje 1961. - 1990. prema rezultatima srednjaka ansambla regionalnog klimatskog modela Reg CM za emisije plinova staklenika za jesen.**



## SPUO VIŠEGODIŠNJEG PROGRAMA GRADNJE KOMUNALNIH VODNIH GRAĐEVINA ZA RAZDOBLJE 2013. – 2023.

**Promjena oborine u Hrvatskoj (u mm/dan) u razdoblju 2041. - 2070. u odnosu na razdoblje 1961. – 1990. prema rezultatima srednjaka ansambla regionalnog klimatskog modela Reg CM za emisije plinova staklenika za zimu i ljeto.**



## SPUO VIŠEGODIŠNJEG PROGRAMA GRADNJE KOMUNALNIH VODNIH GRAĐEVINA ZA RAZDOBLJE 2013. – 2023.

Indikatori	Stanje - 2014. godina (ili zadnji dostupan podatak)	Ocjena pravca kretanja i vrijednosti indikatora
<b>Količina oborina na jadranskoj obali u odnosu na predviđene scenarije klimatskih promjena</b>	Godišnja količina oborina smanjuje se od sjevera prema jugu zbog većeg utjecaja Alpa na sjeverni Jadran. Na Malom Lošinj padne dvostruko više oborine godišnje nego na Visu. Najmanja godišnja količina oborine nalazi se na samoj pučini srednjeg i južnog Jadrana (~ 300 mm). Najveće količine oborina su na Risnjaku i Snježniku iznad Riječkog zaljeva gdje godišnja količina oborine prelazi 1500 mm.	<p>Rezultat scenarija klimatskih promjena u periodu 2041. - 2070. Godine:</p> <p>Zima: promjena nije očekivana</p> <p>Proljeće: očekivano smanjenje za manje od 15 %</p> <p>Ljeto: očekivano smanjenje za više od 20 %</p> <p>Jesen: očekivano smanjenje za manje od 15 %</p> <p>↓</p> <p><b>(negativan utjecaj klimatskih promjena na provedbu Programa)</b></p> <p>Možemo očekivati postepeno pojavljivanje utjecaja klimatskih promjena nezvano za provedbu samog Programa, što podrazumijeva negativan utjecaj klimatskih promjena na izvođenje Programa jer on ovisi o raspoloživosti prirodnih resursa (zalihe podzemne vode) na koje klimatske promjene mogu imati značajan utjecaj.</p>

## SPUO VIŠEGODIŠNJEG PROGRAMA GRADNJE KOMUNALNIH VODNIH GRAĐEVINA ZA RAZDOBLJE 2013. – 2023.

Indikatori	Stanje - 2014. godina (ili zadnji dostupan podatak)		Ocjena pravca kretanja i vrijednosti indikatora
Zalihe podzemne vode po hidrogeološkim vodnim područjima	Zalihe podzemne vode (u milijunima m3)		Indikator nije moguće kvantificirati jer je danas nemoguće predvidjeti opseg utjecaja klimatskih promjena na zalihe podzemne vode bez detaljnog modeliranja.
	sliv Save	1852,1	↓ (negativan utjecaj klimatskih promjena na provedbu Programa)
	sliv Dunava i Drave	810,4	
	Primorsko-istarski slivovi	2639,5	
	Dalmatinski slivovi	3831,3	
	Ukupno	9133,3	
		Prognoze klimatskih promjena ukazuju na smanjenje oborina u narednom periodu, što će utjecati i na smanjenje zaliha raspoložive vode.	

## SPUO VIŠEGODIŠNJEG PROGRAMA GRADNJE KOMUNALNIH VODNIH GRAĐEVINA ZA RAZDOBLJE 2013. – 2023.

Indikatori	Stanje - 2014. godina (ili zadnji dostupan podatak)	Ocjena pravca kretanja i vrijednosti indikatora
<b>Ukupni vodni resursi površinskih voda</b>	Ukupni vodni resursi površinskih voda Republike Hrvatske iznose oko $84 \times 10^9$ m <sup>3</sup> godišnje. Na samom području Republike Hrvatske formira se $11,86 \times 10^9$ m <sup>3</sup> vlastitih voda.	<p>Indikator nije moguće kvantificirati jer je danas nemoguće predvidjeti opseg utjecaja klimatskih promjena na ukupne vodne resurse površinskih voda bez detaljnog modeliranja.</p> <p>↓</p> <p><b>(negativan utjecaj klimatskih promjena na provedbu Programa)</b></p> <p>Prognoze klimatskih promjena ukazuju na smanjenje oborina u narednom periodu, što će utjecati i na smanjenje ukupnih vodnih resursa površinskih voda.</p>

### 3. Assessment consistency with relevant climate change adptation objectives

- **Assessment objectives** — minimal/bottom-line targets or standards that need to be firmly respected by the proposed development
- **Aspirational objectives** — long-term environmental goals that should be considered in the proposed development.

## Case: 6<sup>th</sup> Railroad corridor Zilina-Cierna (260 km)

- Objectives not existing so far
- New study on climate proofing of transport infrastructure about to be launched



### 4. Assessment of cumulative impacts on evolving baseline trends

- Will the proposal have any direct impact the trend? If so, what is the nature of this impact (e.g. reducing air circulation)?
- Will the proposal have any indirect impact by affecting the drivers of the trend (e.g. expanding water demands)?



## Case: 6<sup>th</sup> Railroad corridor Zilina-Cierna (260 km)

- Spatial analyses (now being prepared)
- Crossings with sensitive areas
- Elevation
- Technical design – bridge pillars in torrents (lessons from Alps)



## 5. Considering alternatives and mitigation measures

- Is the development proposal needed in such scale?
- How should the proposed development be carried out?
- Where could it go to cause the least effect?
- When should it be implemented? Which development proposals should be prioritized and which ones should be delayed?



## Principles for selecting recommended options

- `Win-win-win` options that have the desired impacts on climate change, biodiversity and ecosystem services but also have other social, environmental or economic benefits (maintaining forest cover in the watershed, reducing transport, etc.)
- `No-regret` or `low-regret` options that yield benefits under different scenarios (e.g. room for the river policy, moving important developments away from flood zones)
- Favouring reversible and flexible options that can be modified if significant impacts start to occur (e.g. building the dykes so that they can be easily expanded)

23



## Relevant recommendations regarding climate change ...cont.d

- Promoting soft adaptation strategies, which could include building adaptive capacity to ensure a project is better able to cope with a range of possible impacts (e.g. warning systems and management responses, behavioural changes, etc. );
- Delaying projects that are risky or likely to cause significant effects

24



## 6. Monitoring

- SEA should pinpoint any major environmental problems that may arise during implementation of the proposed plan.
- It also provides a feedback mechanism on the state of the environment and identifies issues for the next round of the planning process.



## Relevant recommendations regarding climate change

- clearly acknowledge assumptions and uncertainties
- propose practical monitoring arrangements to verify the correctness of the predictions made and bring any new information to attention by decision-makers.
- Prefer improved exchange of information among relevant government agencies and changes in the monitoring systems;
- New monitoring should be established only if the assessment finds out that some crucial data are missing and this seriously limits understanding of environmental problems in the planning area.



## SEA report

SEA Report should explain:

- What climate change scenarios were considered when designing the proposed development?
- What specific issues and risks been identified and how,
- How were these risks considered in the project design,
- What are the residual risks or concerns, priorities for mitigation
- Gaps in knowledge, suggestions for monitoring and adaptive management



## SPUO VIŠEGODIŠNJEG PROGRAMA GRADNJE KOMUNALNIH VODNIH GRAĐEVINA ZA RAZDOBLJE 2013. – 2023.

### **Očekivani utjecaj:**

KP ⇒ smanjenje količine raspoložive vode u tijelima podzemne vode  
⇒ povećana ranjivost tijela podzemnih voda i smanjiti mogućnost njihovog korištenja za vodoopskrbu i ostale djelatnosti.

### **Procjena utjecaja provedbe Programa:**

- + Dobro stanje svih voda.
- + Smanjenje gubitaka vode u sistemima (dobro upravljanje).
- Program predviđa nov izvorišta pitke vode i na tijelima s lošim ili vjerojatno lošim stanjem.

### **Mjere ublažavanja:**

- Osiguranje dugoročnog dobrog upravljanja.
- Program mora osigurati, da će planiranje i projektiranje na nižim razinama uzeti u obzir KP.



# Thank you for your attention

SEA

guidance <http://ec.europa.eu/environment/eia/pdf/SEA%20Guidance.pdf>

EIA

Guidance <http://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf>

Questions? Comments? Objections?

