



URBAN WASTEWATER TREATMENT

“CHALLENGES AHEAD FOR SERBIA”

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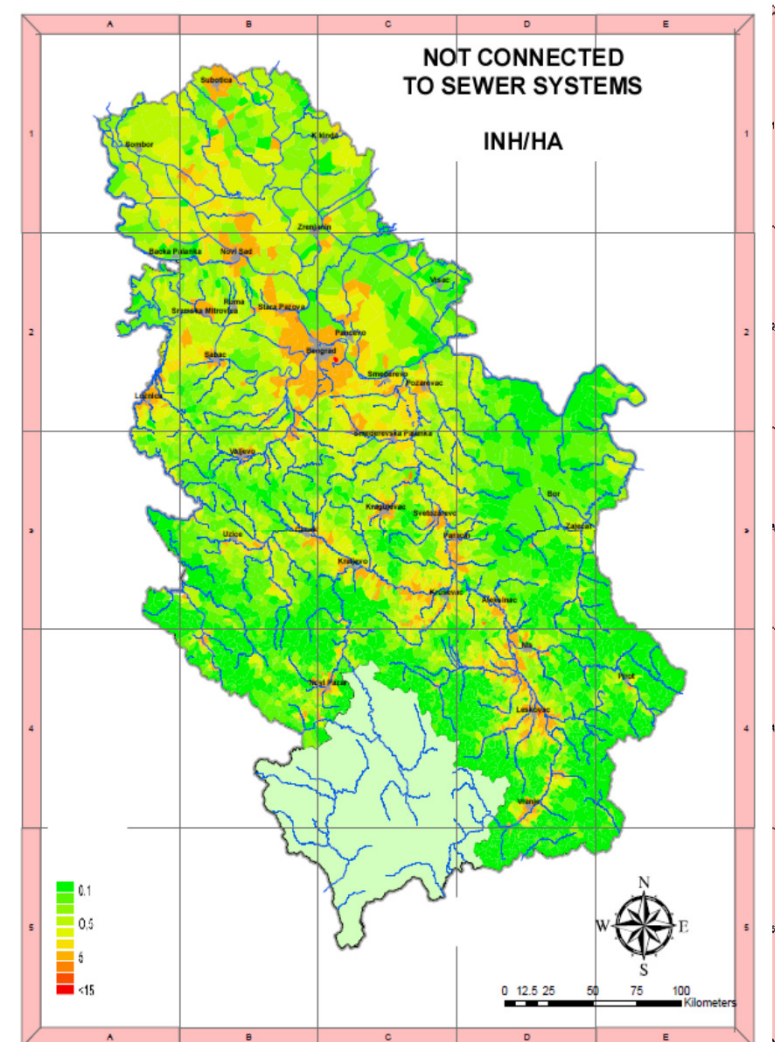
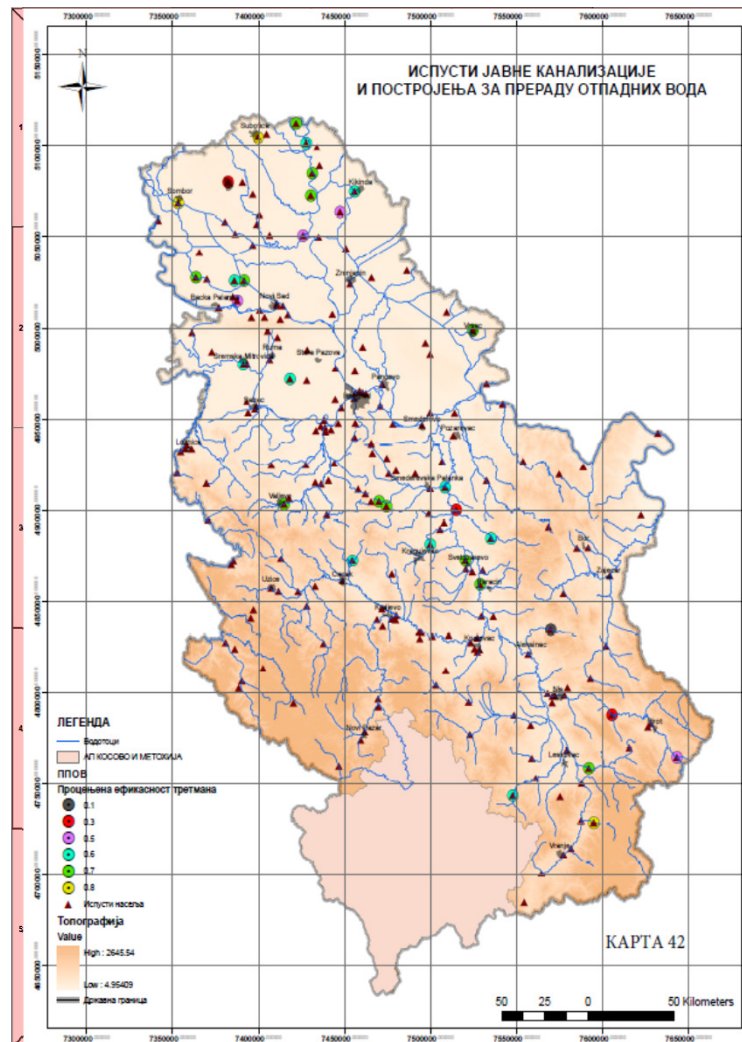
Acknowledgements

- All those involved in development of the National Water Strategy (Plan
- All those involved in the development of the National Water Pollution Control Plan (Draft)
- WATER DIRECTORATE OF THE SERBIAN MINISTRY OF AGRICULTURE AND ENVIRONMENTAL PROTECTION



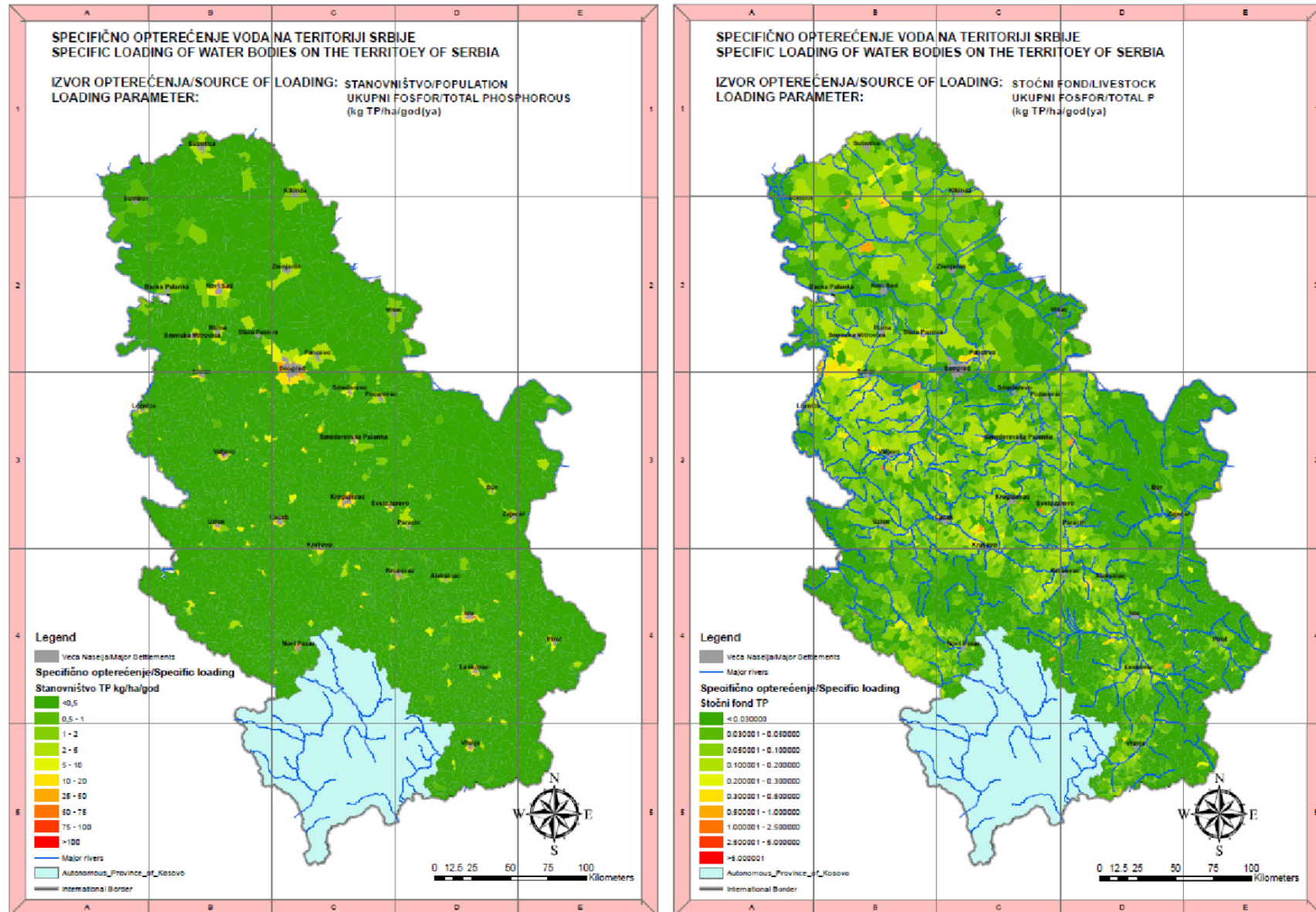
SETTING THE STAGE

Issue of Density



SETTING THE STAGE

Issue of Load (TP)

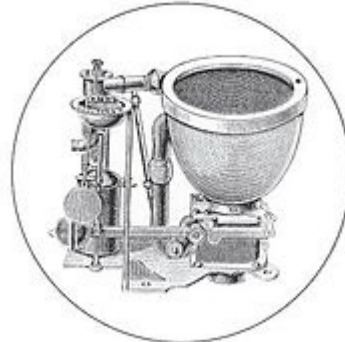
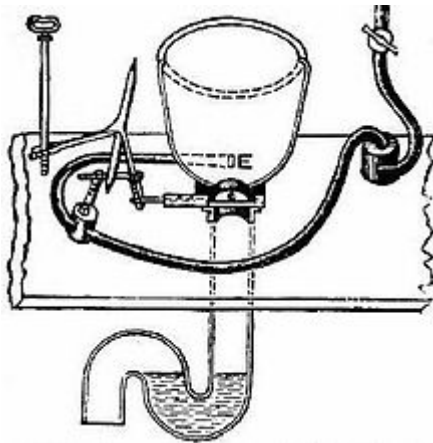


SETTING THE STAGE

The beginning of the problem

Period of [Industrial Revolution](#) and related advances in technology when the flush toilet began to emerge into its modern form.

A crucial advance in plumbing, was the [S-trap](#), invented by [Alexander Cumming](#) in 1775, and still in use today.



THE RESULT



RESPONSE

POPULATION LOAD

WASTE=WASTE

- Water borne sanitation
- Surface waters as a final recipient

WFD, UWWTD

SSD



WASTE WATER TREATMENT

LIVESTOCK LOAD

WASTE=FOOD

- „Dry Sanitation“
- Soil as a final recipient

NITRATE DIRECTIVE



CODE OF GOOD PRACTICE

WHWERE ARE WE NOW?

Source of data: ICPDR

Figure 8: Share of the collection and treatment stages in the total population equivalents in the Danube countries (reference year: 2011/2012, absolute numbers on the top refer to PE)

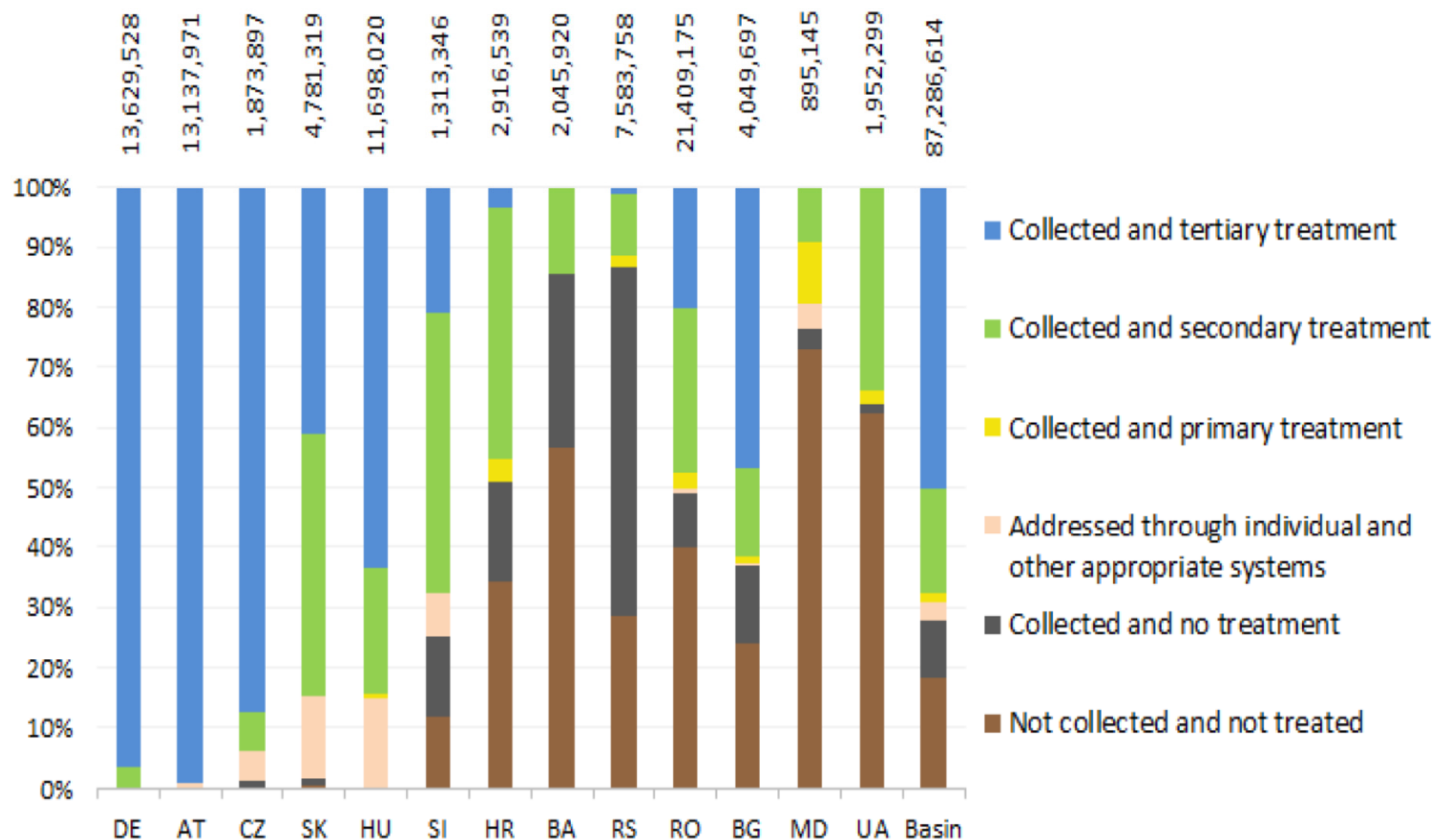
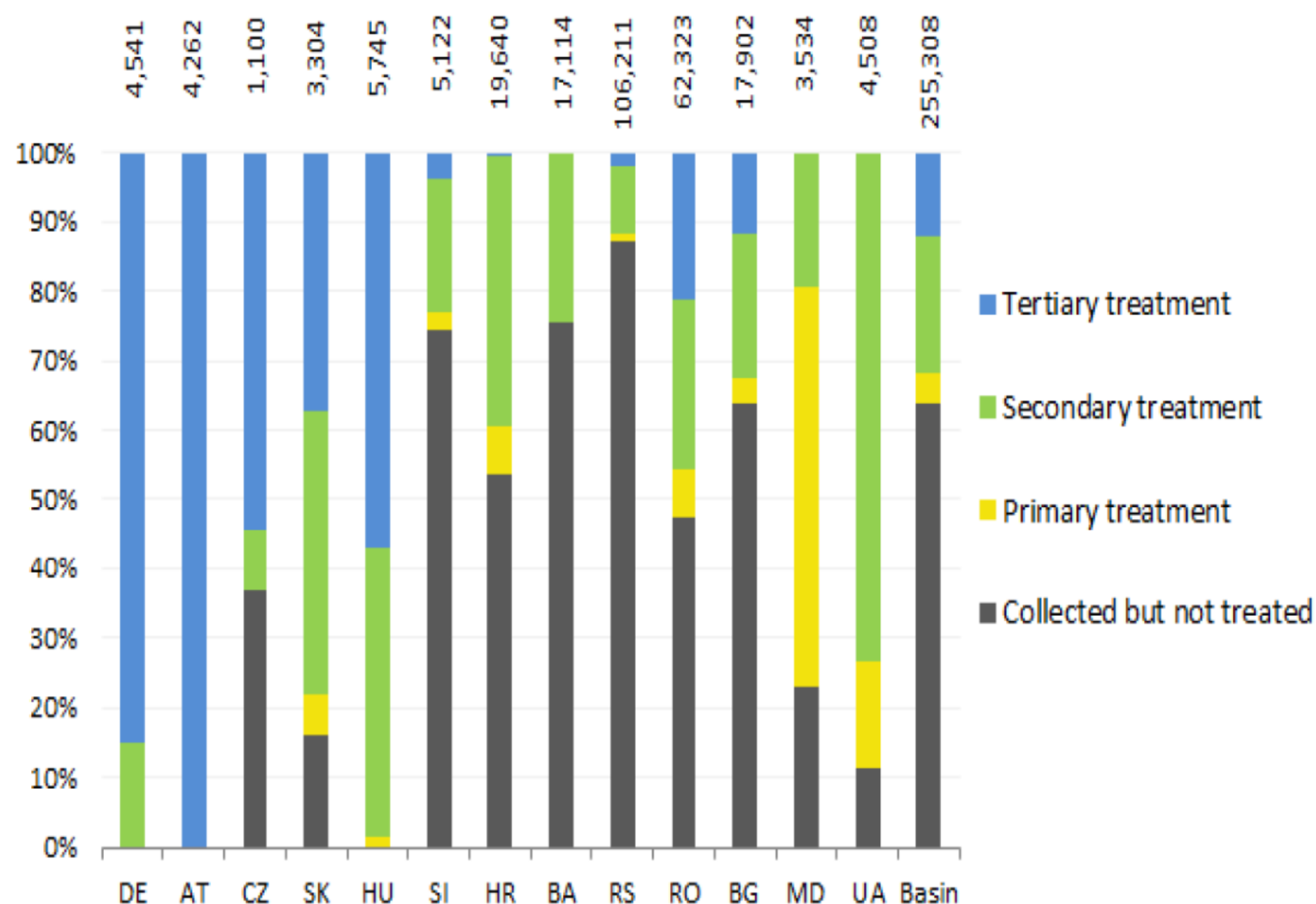
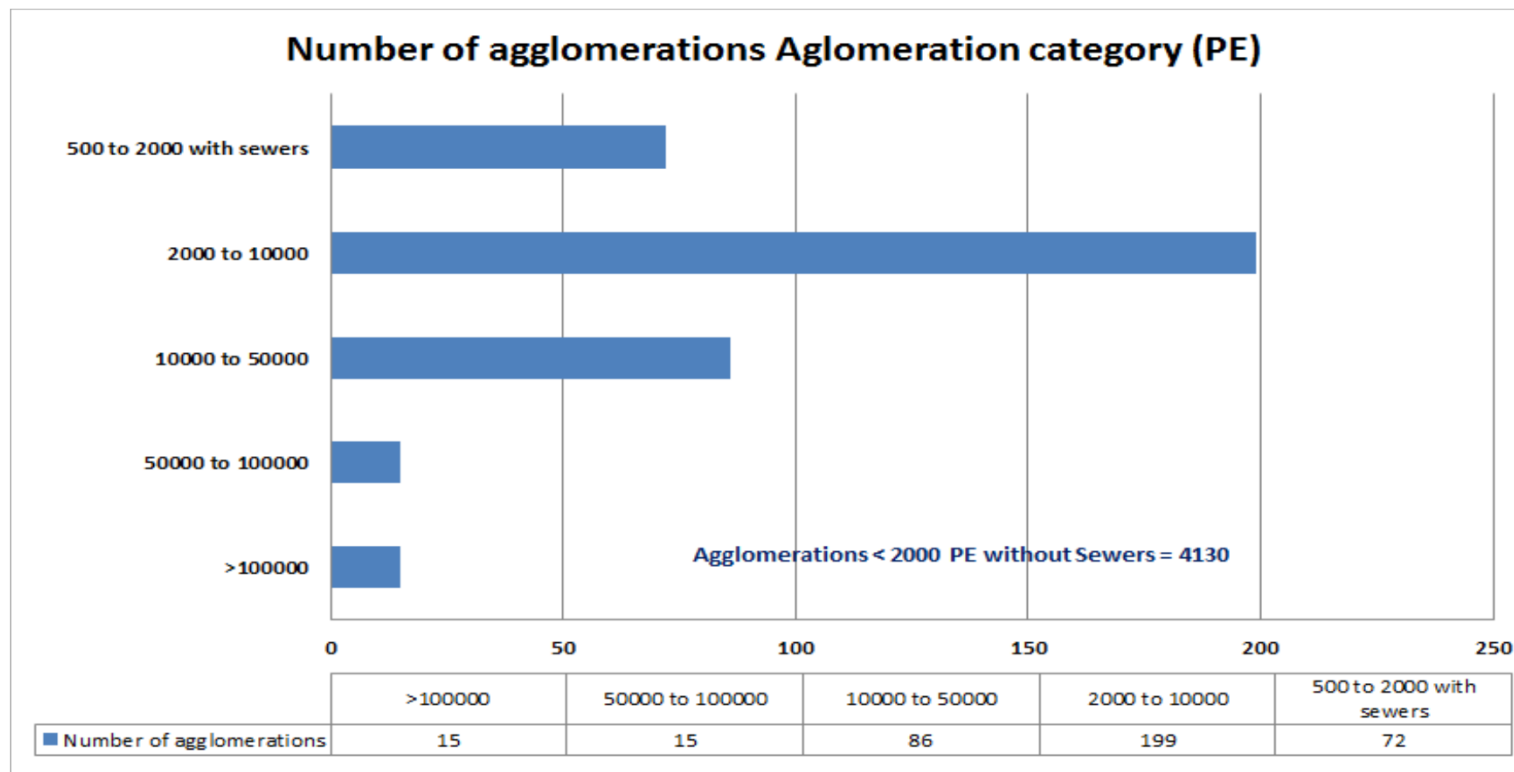


Figure 11: Share of the collection and treatment stages in the total organic pollution of the surface waters via urban waste water in the Danube countries (reference year: 2011/2012, absolute numbers on the top refer to tons BOD per year)

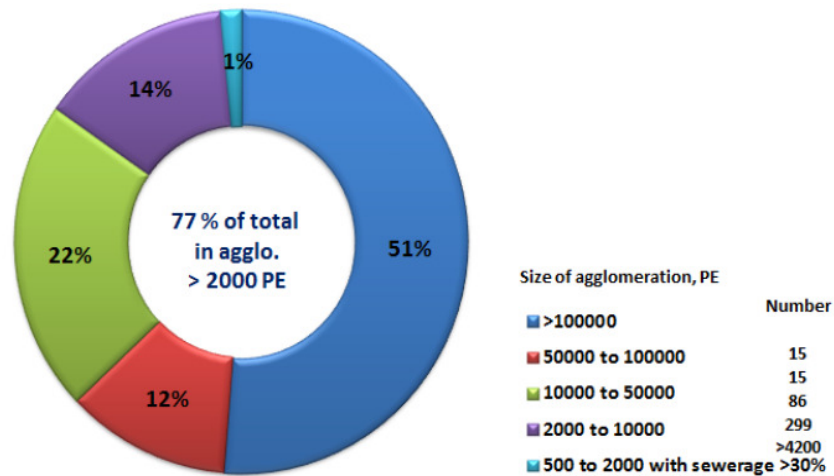


Existing Situation in the Republic of Serbia

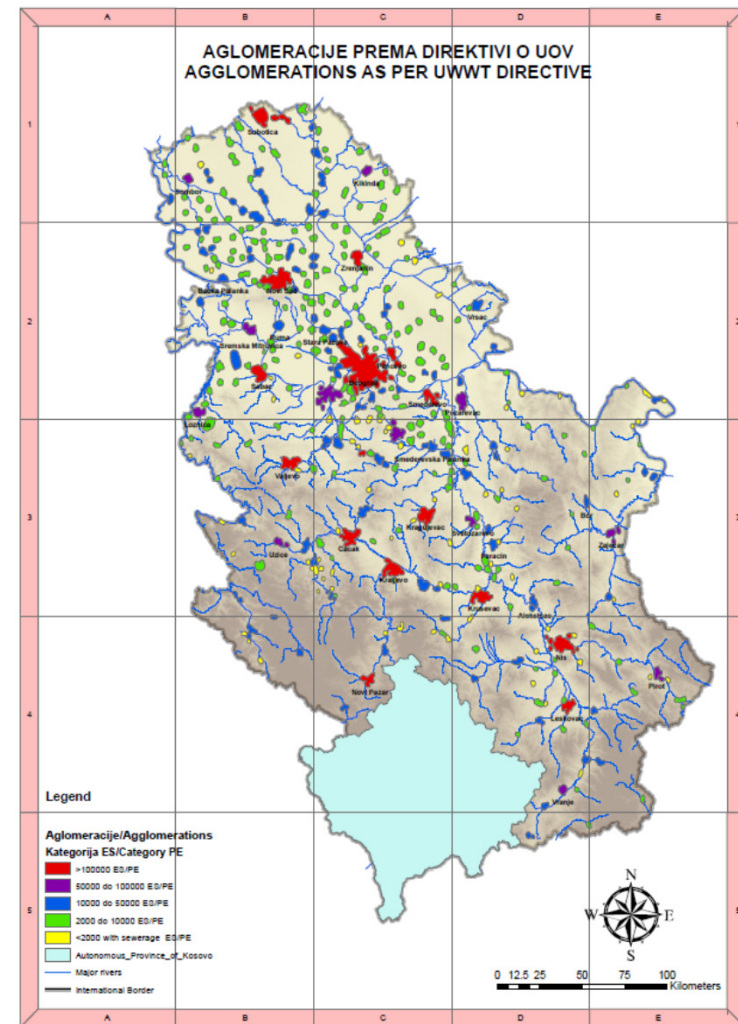
- A total of 4,867 settlements of which 450 have more than 2000 inhabitants according to the census in 2011. They are grouped within 388 agglomerations.



Agglomerations



- Population 5,5 mil
- Load app 7,5 mil PE



UWWT PLANTS

ППОВ Subotica



ППОВ Лјанковц



1 TERTIARY PLANT
37 SECODARY PLANTS OF WHICH 20 WORKING AS SUTISFACTORY
7,5% OF TOTAL COLLECTED LOAD TREATED

THE ROAD AHEAD

- National water pollution protection plan(Draft)
 - Defines **priorities** and propoases time frames for implementation
 - Many choices yet to be made
 - Is tertiary treatment **a must** or are there other options
 - Are **sewers the best choice for all communities** or are there other feasible options
 - How **are we going to pay** for this?

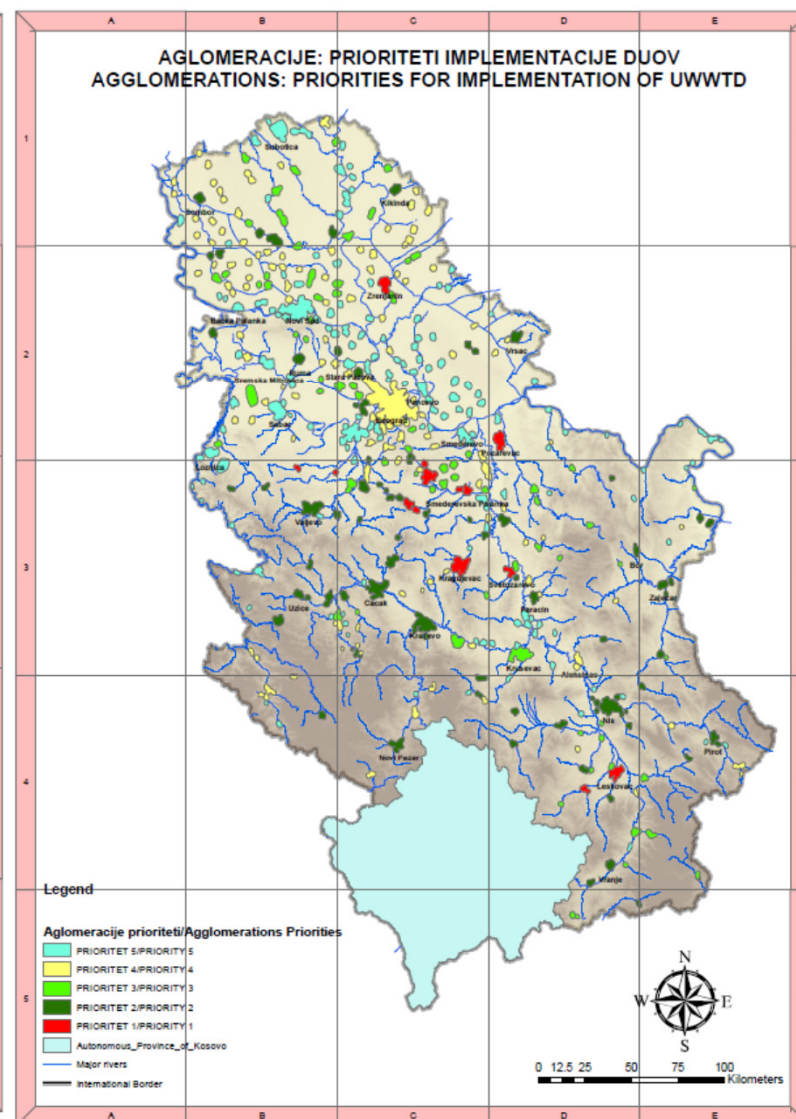
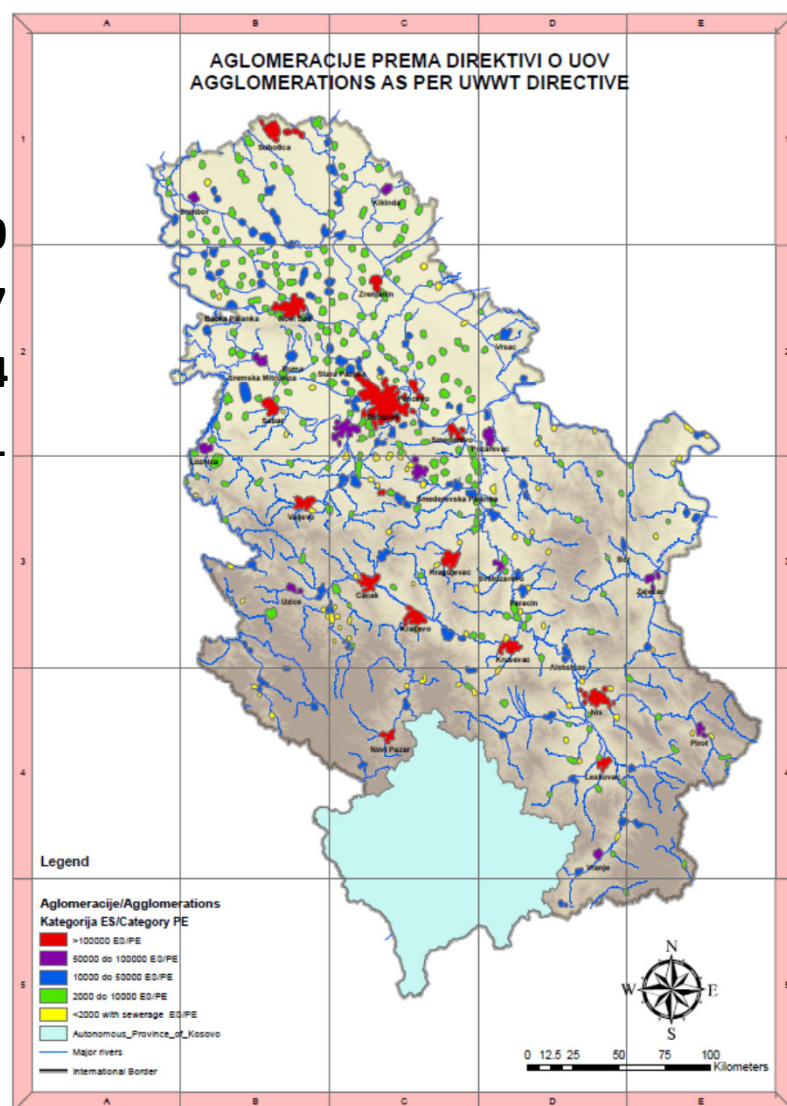
Criteria for prioritisation and state intervention

- In the spirit of WFD
 - Good status of water bodies is a priority
 - Maximize water body status improvement per unit of investment
 - Large settlements on small streams - **specific load per unit of recipient flow under critical conditions.**
 - Affordability

THE ADOPTED PRIORITISATION RESULTS

Planning
periods:

1. 2015-2020
2. 2021-2027
- 3- 2028-2034
4. 2035-2041



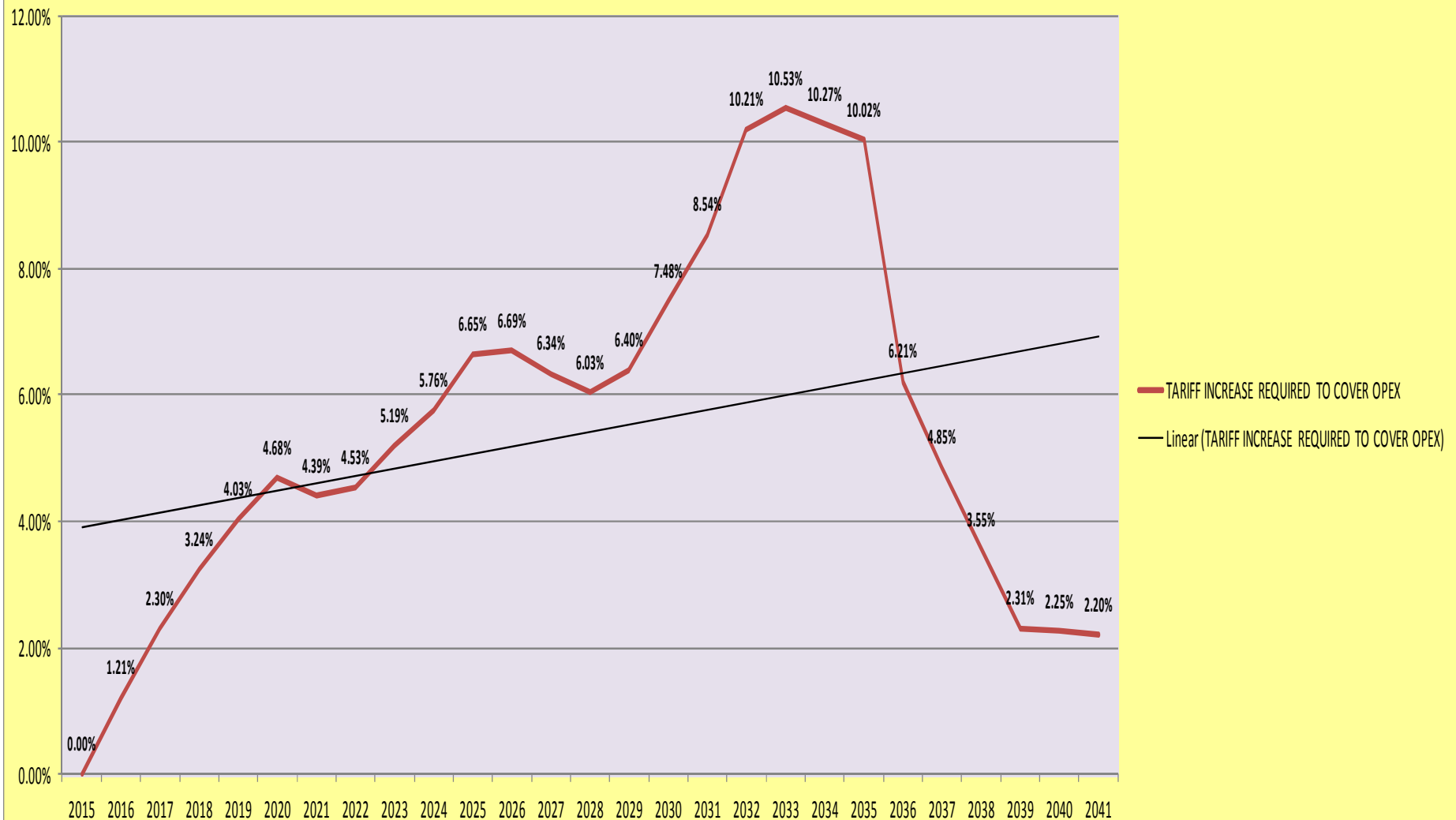
THE RESOURCES NEEDED

UWWT DIRECTIVE IMPLEMENTATION COSTS	
P.EQ.	8,332,311
POPULATION 2011	5,475,401
Investment category	In Millions
PREPARATION COSTS, MILLION	€ 582,44
SEWAGE NETWORK	€ 1.553,51
TREATMENT FACILITIES	€ 3.408,74
TOTAL INVESTMENTS	€ 4.962,26
Tertiary treatment component, 22%	€ 766,43

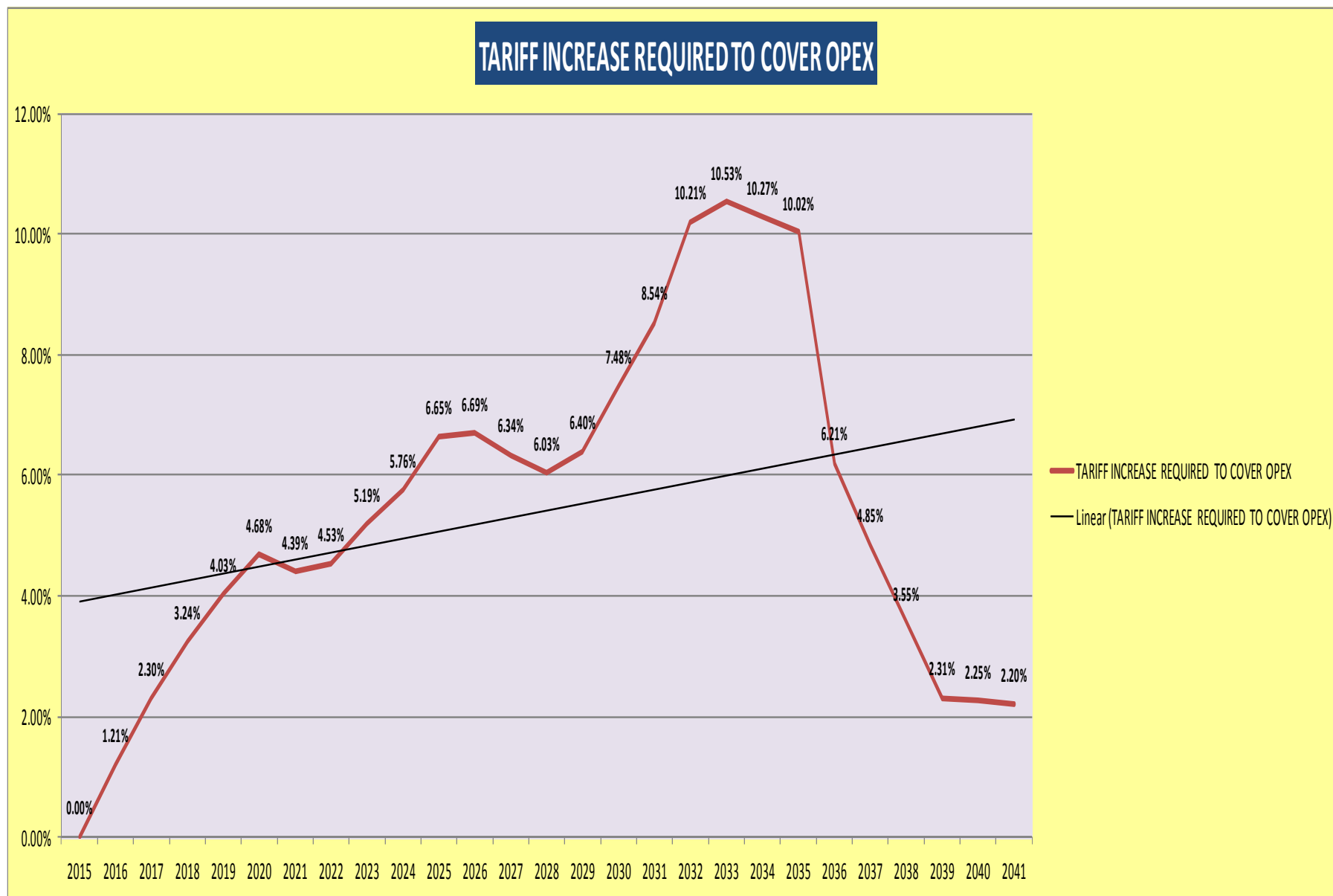
Scheduling
Summary costs estimated over period 2015 to 2041
(euro mill)

Financing period 2015-2041	2015-2020	2021-2027	2028-2034	2035-2041	Total 2015-2041
Estimated Investment costs	374.88	1,143.49	2,404.97	1,038.92	4,962.26

TARIFF INCREASE REQUIRED TO COVER OPEX



Scenario 1. OPEX has been estimated in accordance with RS domestic engineering estimates that are somewhat higher than international benchmarks. This is in part justified by the need to absorb backlog in maintenance of existing very deteriorated networks. Under this Scenario the necessary Tariff increases during the period will need to be between 5 and 10% each year of the approximation effort. This will stress limited affordability to a very high degree.



Scenario 2. OPEX has been calculated more in line with International Benchmarks. The results are a requirement for Tariff increases somewhat lower, between 4 and 7%, still a very taxing effort.

	NOMINAL € MILLION	%	NPV AT 4%
TOTAL OPEX	4 627,58	48%	
COST RECOVERY FROM WATER TARIFFS	4 627,58	100%	2 116,86
TOTAL INVESTMENT COSTS	4 962,26	52%	2 717,16
EU GRANTS AND OTHER DONORS	2 649,13	53%	
NATIONAL CONTRIBUTION	2 313,13	47%	
TOTAL INVESTMENTS AND OPERATING COSTS	9 589,83	100%	4 834,02

EXPECTED EFFECTS OF IMPLEMENTATION

Planning period	Estimated of water body with improved status
Priority 1 (2015-2020)	< 400 km
Priority 2 (2021-2027)	>1500 km
Priority 3 (2028-2034)	>1000 km
Priority 4 (2035-2041)	<600 km

Expected effects

- Priority 1 300 km of water bodies move to good status
- Priority 2 More than 1000 km of water bodies move to good status
- Priority 3 More than 1000 km of water bodies move to good status
- Priority 4 More than 500 km of water bodies move to good status

MESSAGE FOR FROM SERBIA



- **Boosting** investment is **OK** if it is:

- **S**ustainable
- **M**ultiplying
- **A**ffordable
- **R**eally needed
- **T**horoughly evaluated

IT IS ALL ABOUT
MAKING THE RIGHT
CHOICE

IF HISTORY IS THE
LESSON THE
CHANCE FOR
SUCESS IS SMALL

MAKING THE RIGHT CHOICE IS NOT EASY

- Right choice is not „one approach fits all“ that many biurocrats associate with and which is against the spirit of the WFD and the UWWTD
- Right choice is the one that recognises specificities and requirements a particular situation at a particular time.

Instead of conclusions

What will we do after 2041?



Throw more money down the drain?

Thank you for attention!



REMINDER 1

WFD

- The purpose is to establish a framework for the protection of waters:
- **To prevent further deterioration and protect and enhance the status of water bodies**
- To promote sustainable water use based on a long-term protection of available water resources
- Etc....

UWWTD

- This Directive concerns the collection, treatment and discharge of urban waste water.
- The **objective of the Directive is to protect the environment from the adverse effects of waste water discharges.**



REMINDERS

- The UWWT Directive a „**key element**“ of EU water **policy**.
- Articles 3 and 4 **oblige** Member States to provide for a collecting system and secondary treatment for urban waste water from agglomerations with >2,000 population equivalents.
- **Danube Region Strategy PA 4.04** To continue boosting major investments in building and upgrading urban wastewater treatment facilities across the Danube Basin.

