

Requirements for wastewater and wastewater treatment plants within public services sector

Baiba Gulbe,
LWWWWA

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Wastewater treatment plant operators faced many requirements - legislation, society, municipality, stakeholders...working principles and legislation are practically the same in all Baltic countries, but...



**What are
the
situation in
Latvia...??**

PRINCIPLES...



**POLLUTER PAYS
PRINCIPLE**

**EXTENDED
PRODUCER
RESPONSIBILITY**

to make the party responsible
for producing pollution
responsible for paying for the
damage done to the natural
environment

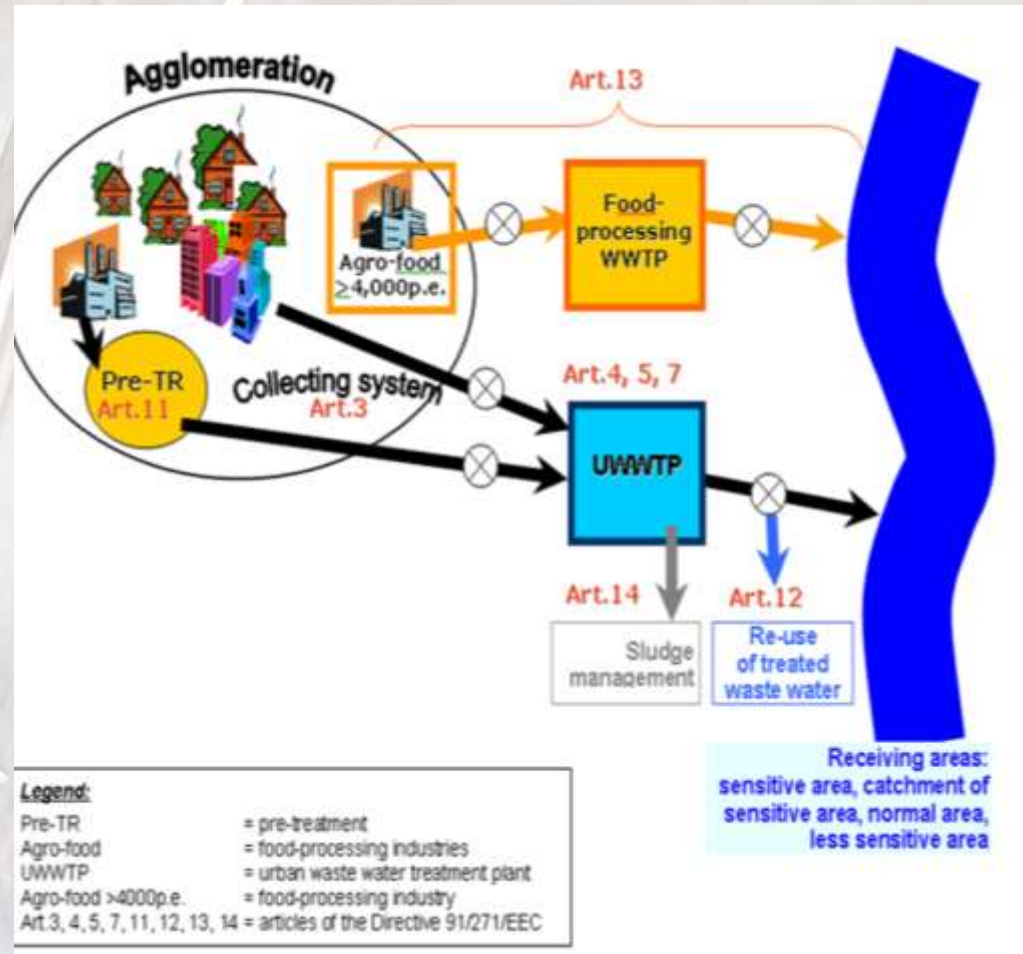
**WWTP operators respect
polluters pay principle
and pays penalties if there are
damage done to environment**

**penalties
payed
from
tarrif?**

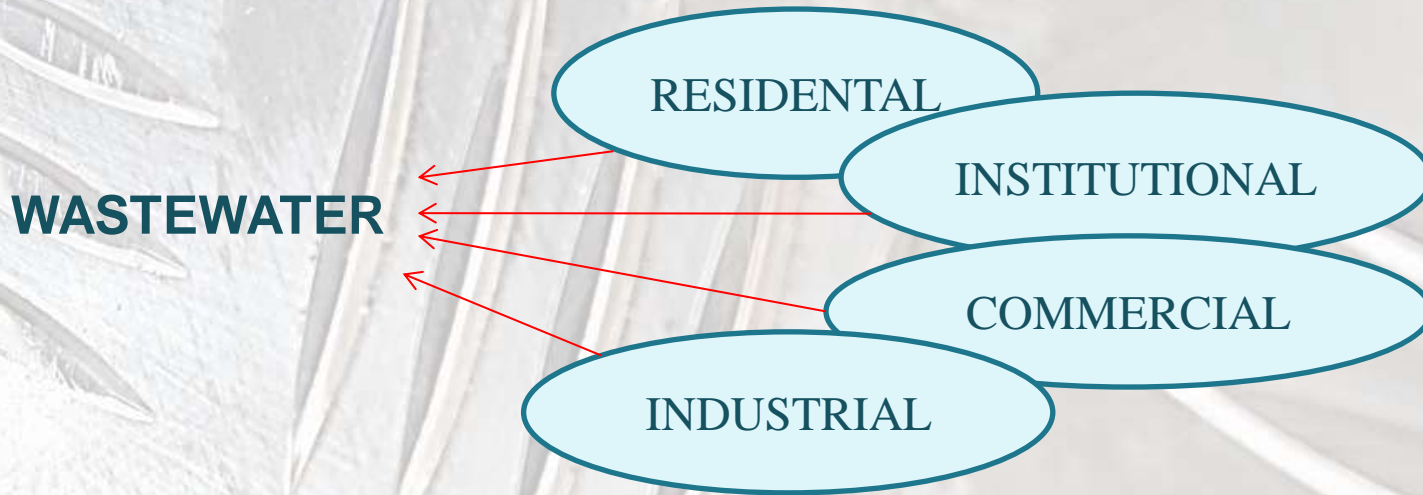
LEGISLATION FRAME

The Urban Waste Water Treatment Directive 91/271/EEC

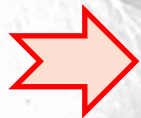
"collection, treatment and discharge of urban waste water and the treatment and discharge of waste water from certain industrial sectors"



Typical wastewater parameter levels



Urban waste water



domestic waste water or the mixture of domestic waste water with industrial waste water and/or run-off rain water



	mg/l _{min}	mg/l _{max}
Chemical oxygen demand (COD)	210	740
Biochemical oxygen demand (BOD₅)	150	350
Total suspended solids	120	450
Total nitrogen (N_{tot})	20	80
Total phosphorus (P_{tot})	6	23

Comparison of requirements

Parameters	PE	Latvian legislative requirements		HELCOM	
		Mg/l	% reduction	Mg/l	% reduction
Total phosphorus (P _{tot})	<2 000	appropriate treatment			
	2 000-10 000	appropriate treatment	10-15		
	10 000-100 000	2	80	0.5	90
	>100 000	1	80		
Total nitrogen (N _{tot})	<2 000	appropriate treatment			
	2 000-10 000	appropriate treatment	10-15		
	10 000-100 000	15	70-80	15	70-80
	>100 000	10	70-80		
Biochemical oxygen demand (BOD ₅)	<200	appropriate treatment			
	200-2000	appropriate treatment	50-70		
	2 000-10 000	25 mg/l	70-90		
	10 000-100 000	25 mg/l	70-90	15	80
	>100 000	25 mg/l	70-90		
Chemical oxygen demand (COD)	<200	appropriate treatment			
	200-2000	appropriate treatment	50-75		
	2 000-10 000	125	75		
	10 000-100 000	125	75		
	>100 000	125	75		
Total suspended solids	<10000	<35	90		
	>10000	<35	90		

Monitoring requirements

PE	Amount of wastewater samples taken per year <i>(inlet and outlet)</i>
2 000 - 9 999	<ul style="list-style-type: none"><li data-bbox="600 525 1151 572">12 samples 1st year<li data-bbox="600 625 1831 743">4 samples per year if wastewater treated as required<li data-bbox="600 796 1831 915">12 samples per year if at least <u>one of monitoring parameters</u> exceeds required limits
10 000 – 49 999	<ul style="list-style-type: none"><li data-bbox="600 949 942 996">12 per year
50 000 – 100 000	<ul style="list-style-type: none"><li data-bbox="600 1031 942 1078">24 per year
> 100 000	<ul style="list-style-type: none"><li data-bbox="600 1112 942 1159">24 per year

Regulations Regarding Discharge of Polluting Substances into Water

These are
class 3 to 5
substances
according to
tax penalties
law

metals, metalloids and their compounds including zinc, copper, nickel, chromium, lead, selenium, arsenic, antimony, molybdenum, titanium, tin, barium, beryllium, boron, uranium, vanadium, cobalt, thallium, tellurium and silver

substances which have an adverse effect on the oxygen content in water, particularly ammonia and nitrites

biocides and substances or products obtained in reactions

There are following groups of dangerous substances:

cyanides and fluorides

toxic or persistent (stable) organic compounds of silicon, and substances which may give rise to such compounds in water, excluding those which are biologically harmless or are rapidly converted in water into biologically harmless substances

non-persistent (non stable) mineral oils and hydrocarbons of petroleum origin

phosphorus and inorganic compounds of phosphorus

Tax penalties per ton of hazards harming environment

Polluting substances are classified according to the hazardness class (*Law on environmental tax*):

Non-dangerous substance € 5.50

Suspended substances (non-hazardous) € 14.23

Environmentally hazardous substances, with the exception of total phosphorus (P total.) € 42.69

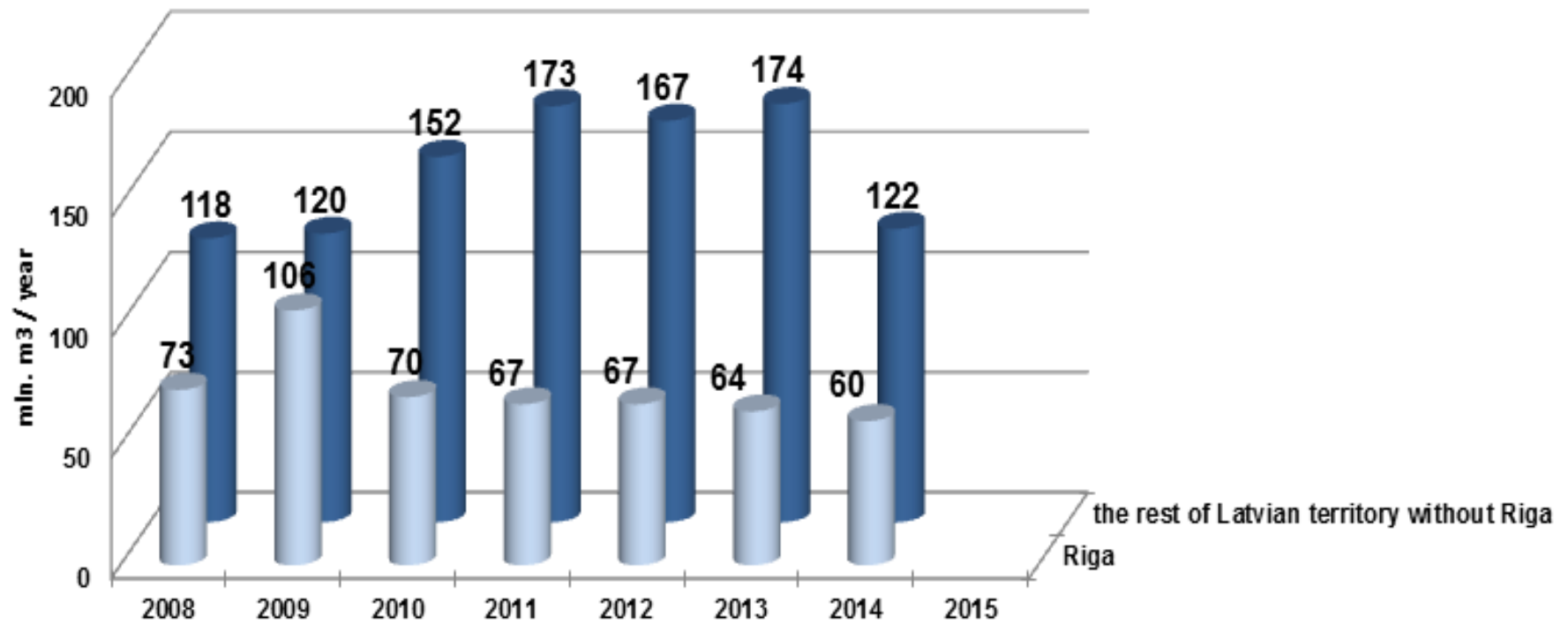
Dangerous substances € 11 382.97

Specific dangerous substances € 71 143.59

Total phosphorus (P total.) € 270.00

The total volume of waste waters in Riga and other Latvian territory 2008-2015

(Source: State Ltd. "Latvian Environment, Geology and Meteorology Centre")



The total volume of waste waters in major Latvian towns 2008-2015

(Source: State Ltd. "Latvian Environment, Geology and Meteorology Centre")

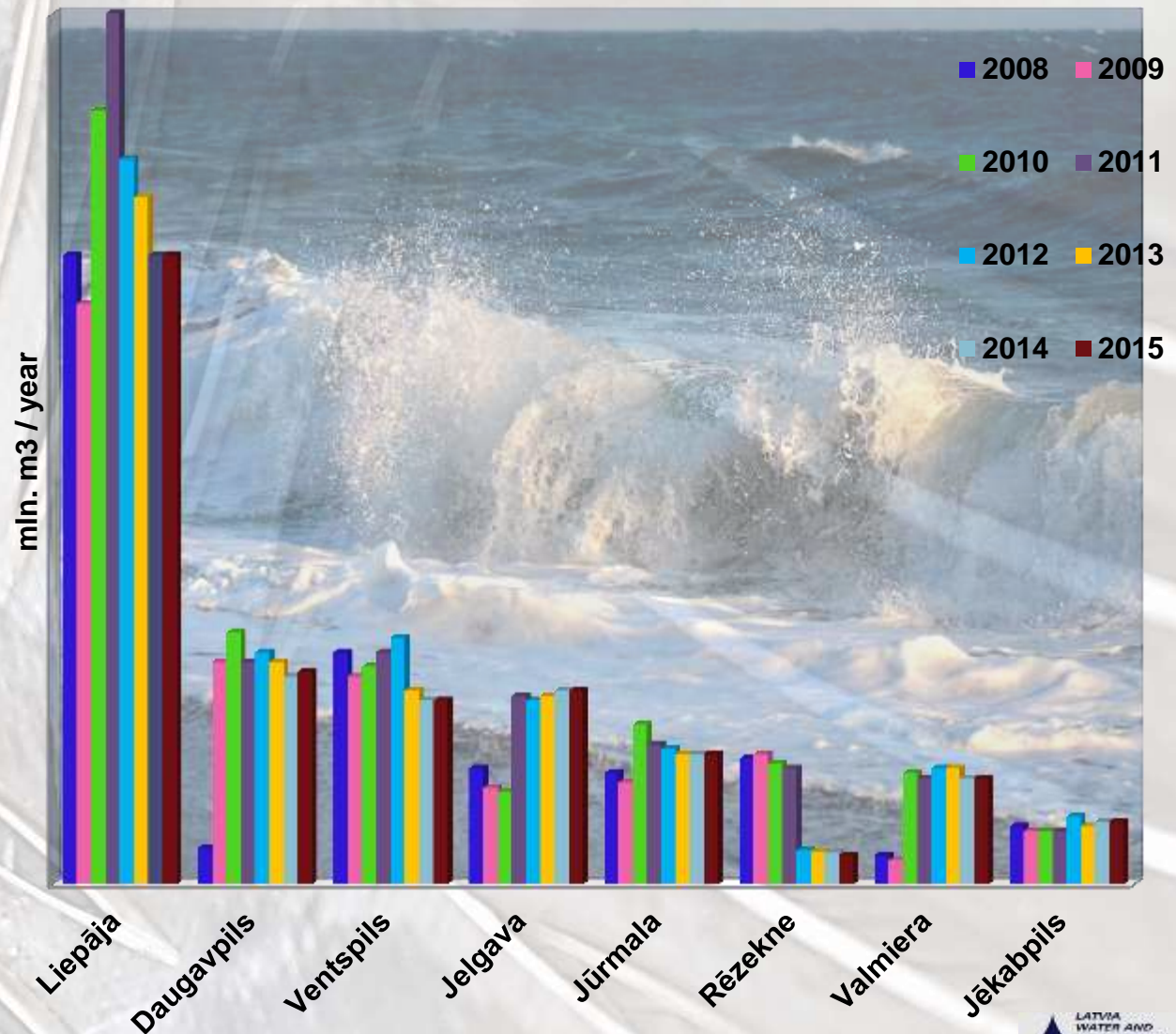
Rain water impact:

Liepāja – 50% of flow is rainwater

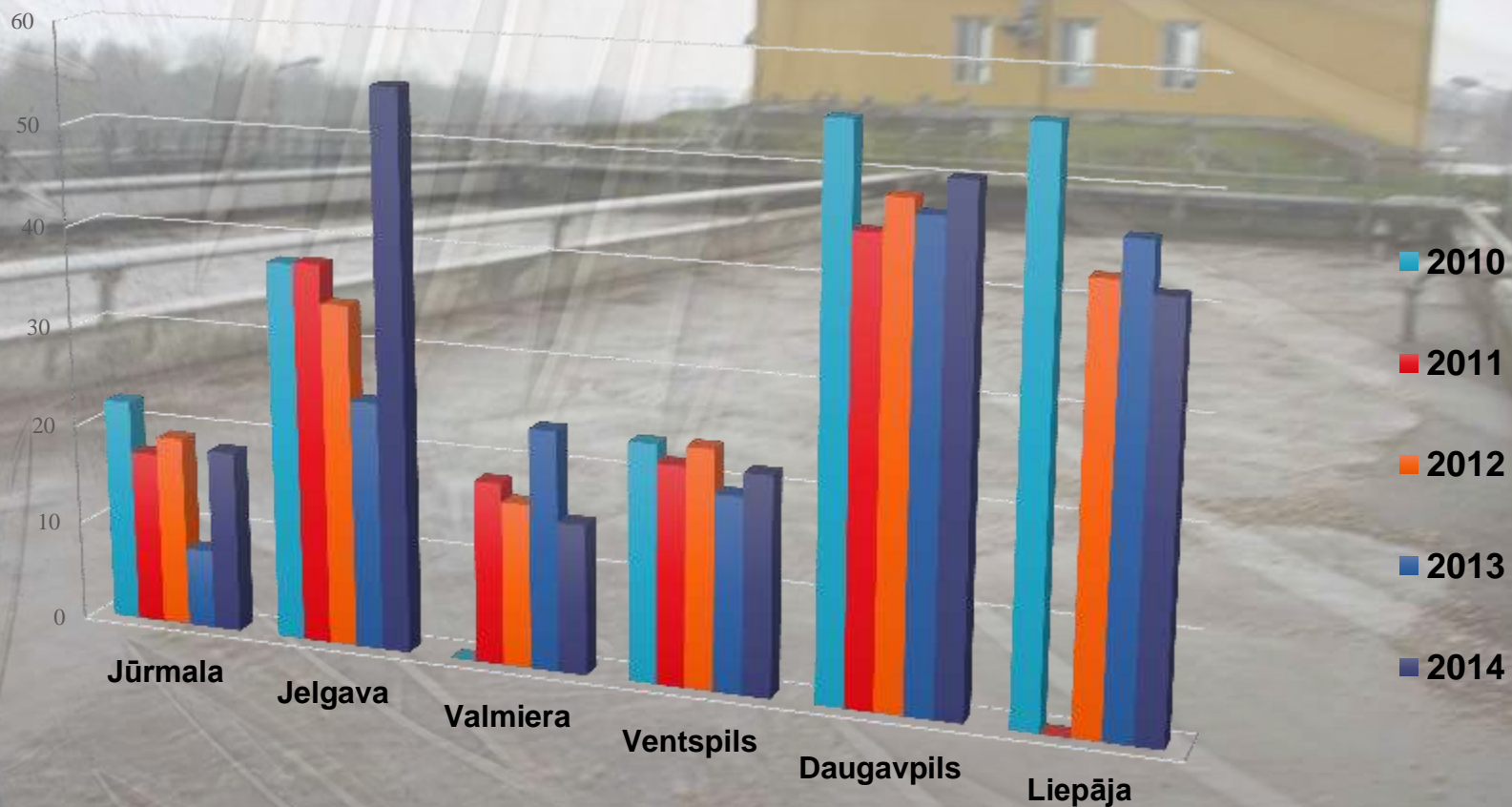
Industry impact:

Industries without pre treatment -

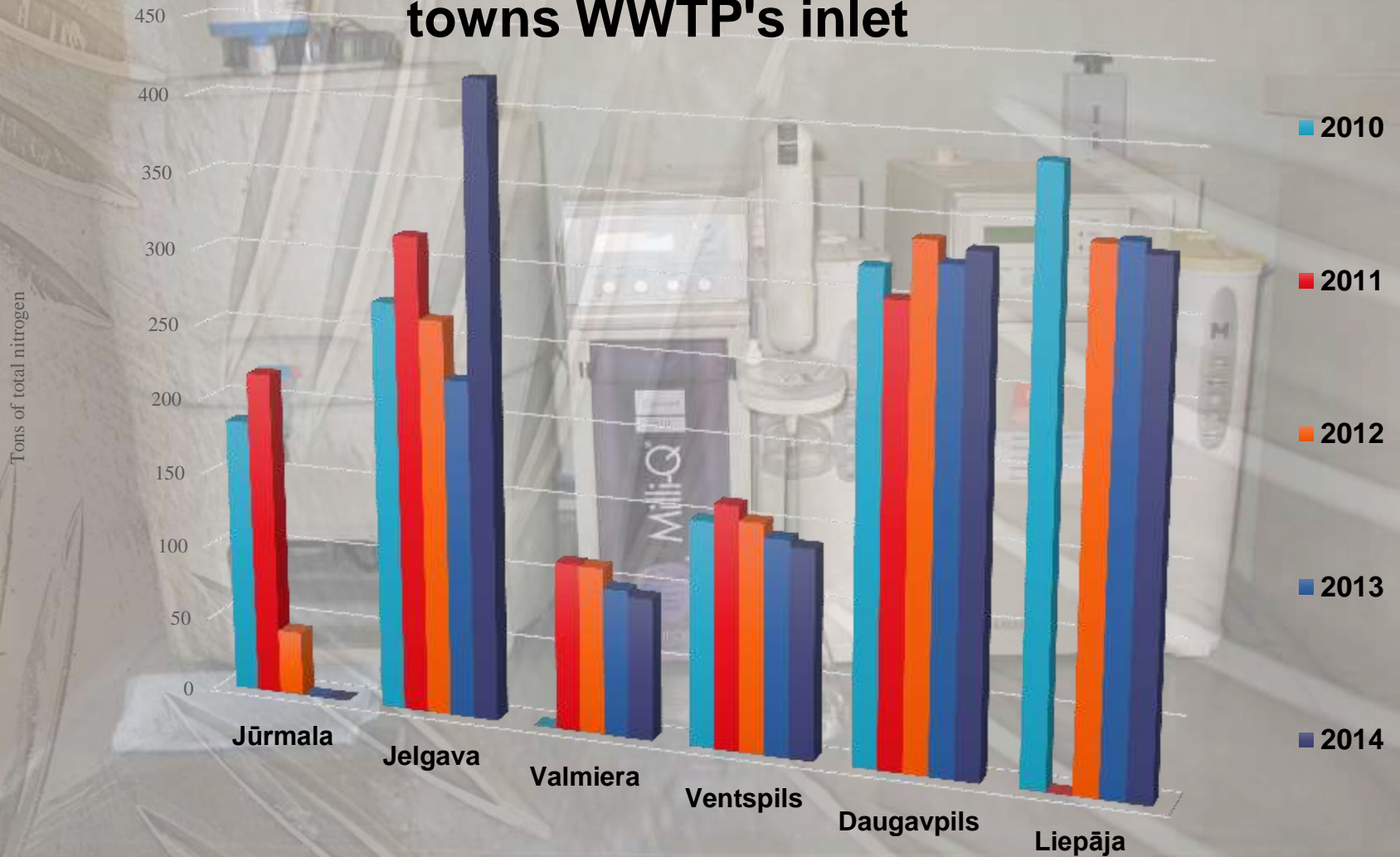
- **Milk industry,**
- **Beer industry,**
- **Meat industry**



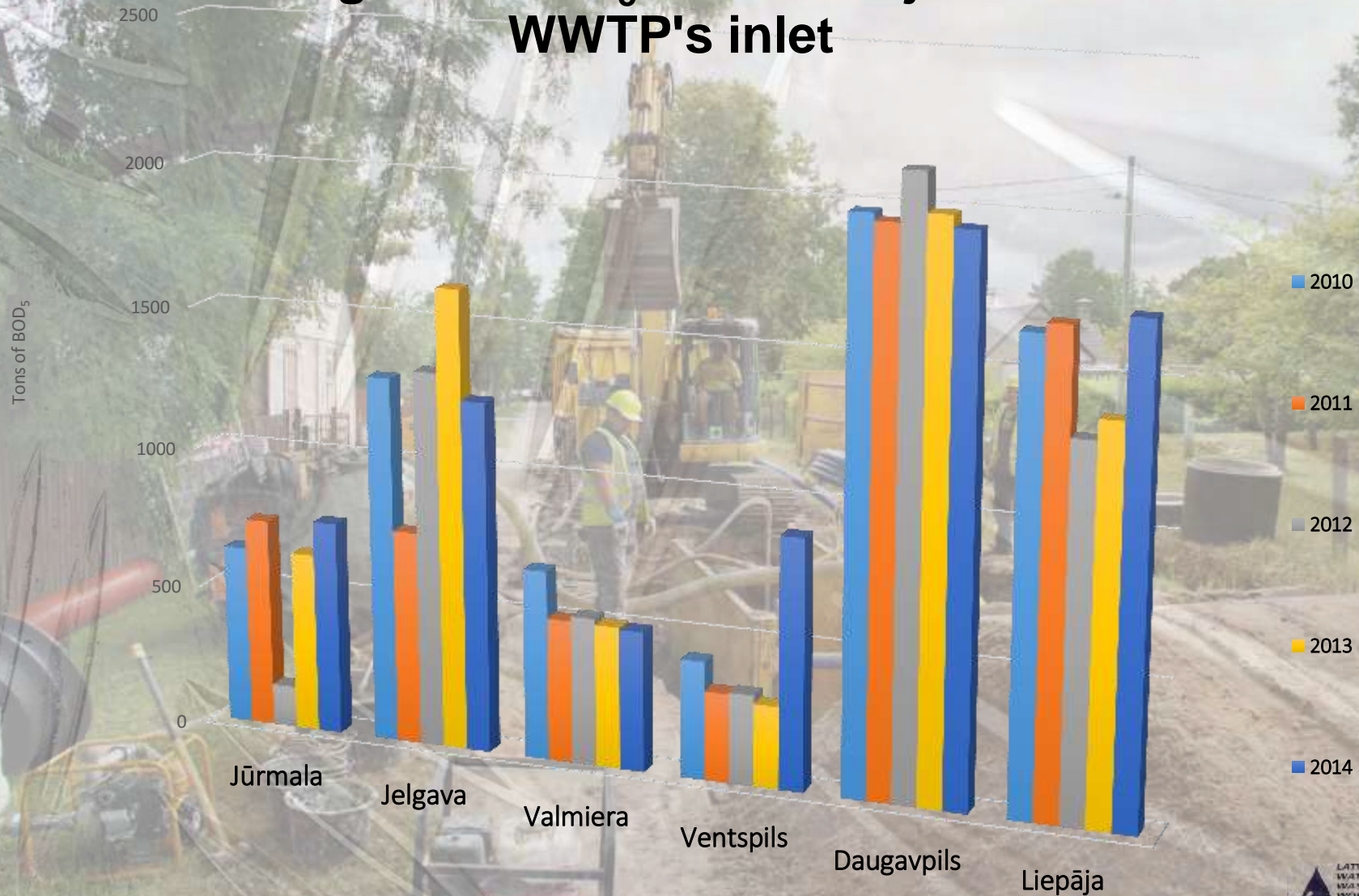
Changes of total phosphorus load in major towns WWTP's inlet



Changes of total nitrogen load in major towns WWTP's inlet



Changes of BOD₅ load in major towns WWTP's inlet



PE shows the actual capacity of wastewater treatment plants

TSS **170**

BOD₅ **115**

COD **300**

P_{tot} **4.2**

N_{tot} **21**

Grease **2**

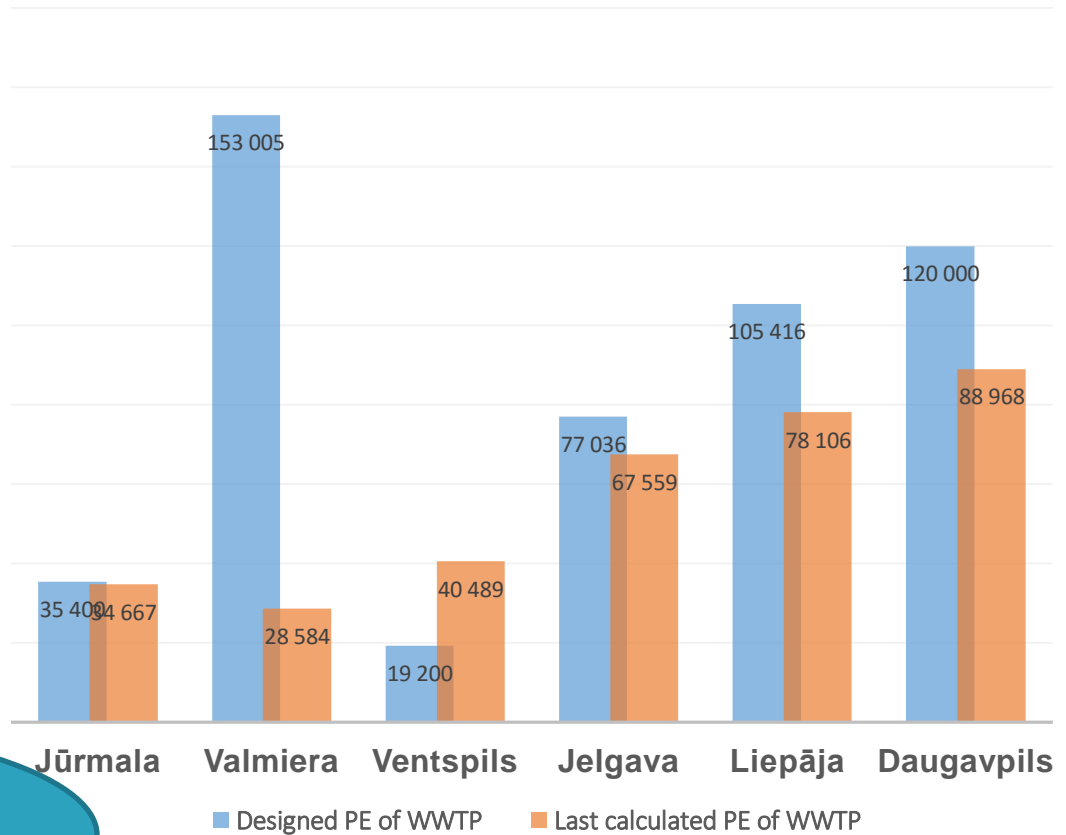
Petroleum products **2.5**

Sulphides and H₂S **1.5**

/Liepāja example/

No additional
payment for industrial
customers

PE designed vs actual in major WWTP in Latvia



POLLUTERS PAY - how much?

Legislation allows



- To set maximum concentration limits in each WWTP
- but excess concentrations can't cover by tariff

Before there are no methodology.

Some of operators adapted principles set by environment penalties
(10 times more of excess parameter should be paid)
to their industrial customers

After 1st. of April, 2016
(Law on water management services and Regulation of cabinets of ministers on public water services use) –
new methodology → **much higher payment for wastewaters treatment**

BEFORE
+ 0,35 €/m³
NOW
+ 12,86 €/m³

CONCLUSIONS

- ✳ Water use (and wastewater amount) from households decreased approx. by 35%
- ✳ Designed load is higher than real load (from 2% to 81%)
- ✳ Some WWTP need some industrial wastewater to ensure right organic balance to treat N un P
- ✳ Concerning's - residential and commercial wastewaters some times are more hazardous than industrial
- ✳ Sustainability- balance penalties and economical growth

**What's your opinion,
experience???**

Thank you!

