

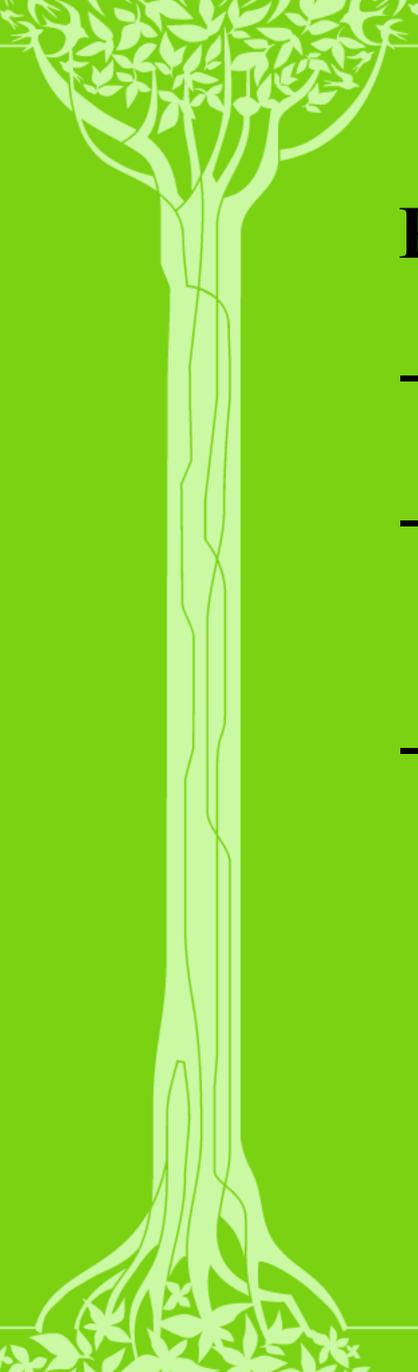


8<sup>th</sup> Global Conference on Environmental  
Taxation, München 2007

Ecological Tax Reform in Estonia and  
Innovation Perspectives in the Energy  
Sector

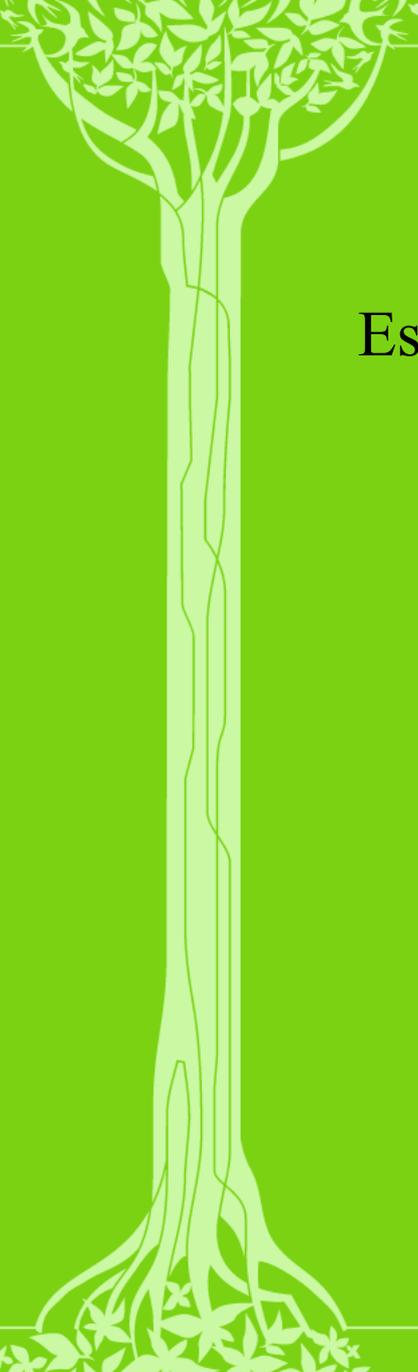
Eva Kraav & Silja Lüpsik

MINISTRY OF THE ENVIRONMENT  
Estonia



## Presentation outline:

- Overview of the ETR
- Promotion of innovation – Estonian method
- Estonian Energy Sector – challenges, application of ETR instruments, innovation perspectives

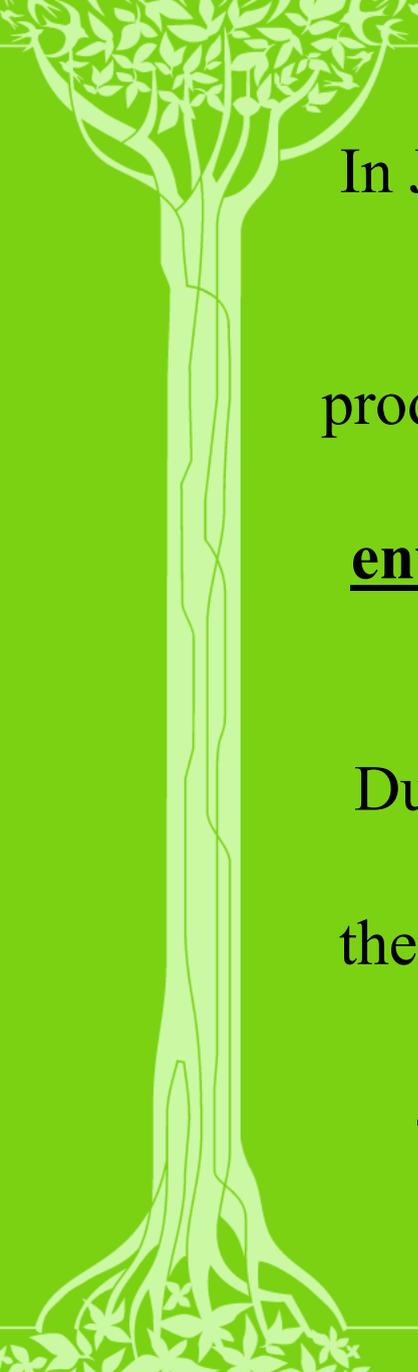


Estonia has launched the Ecological Tax Reform.

Since 1990s environmental taxes apply:

- fuel excises (motor + heating);
- environmental resource taxes;
- pollution taxes.

Tax rates have been increasing step-by-step considering the economic development and consumers' ability to pay.

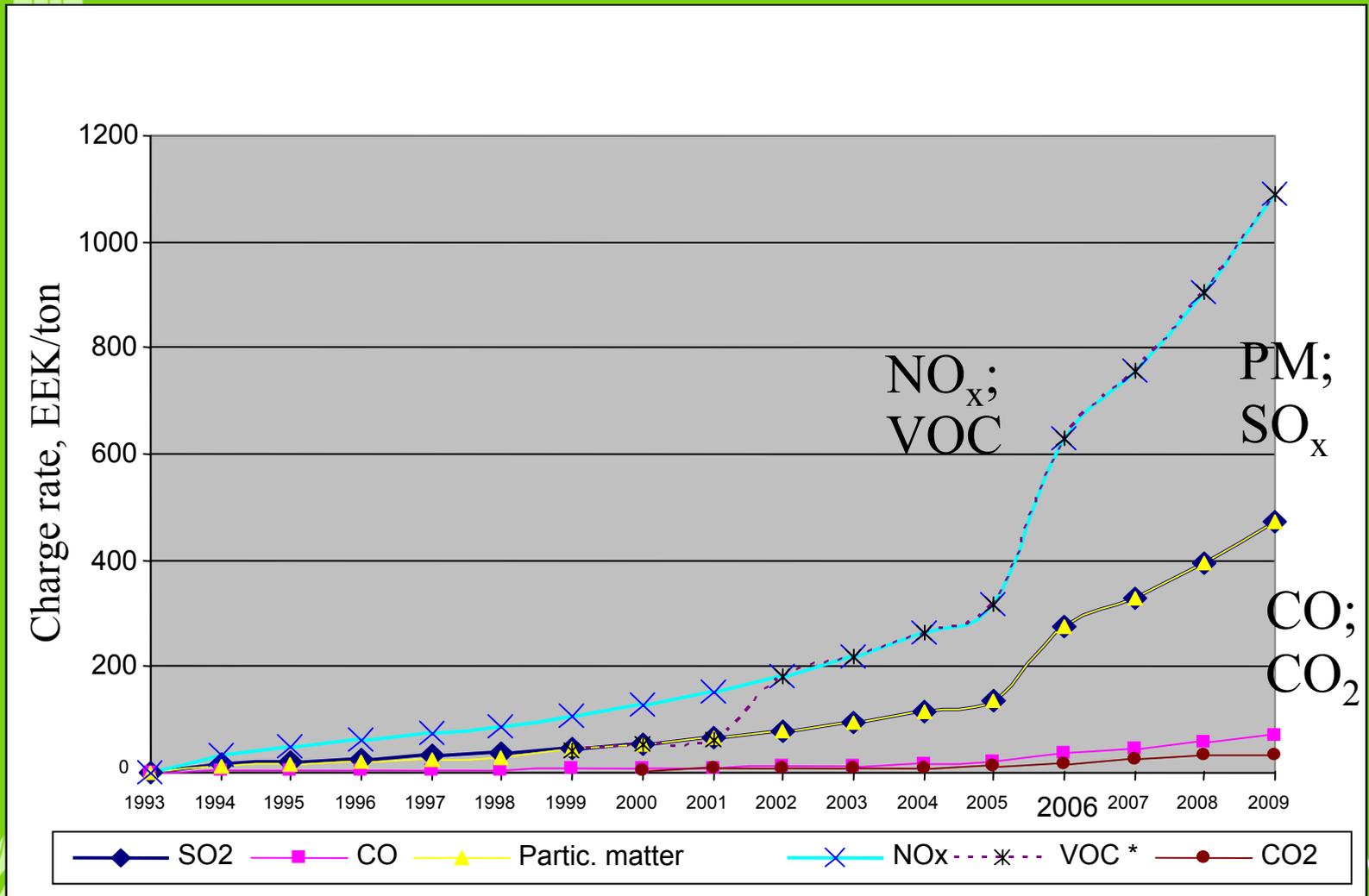


In June 2005 the Estonian Government approved the Ecological Tax Reform Principles i.e. in parallel to reduction of income tax rates the producers and population were given a clear **SIGNAL** that the State of Estonia starts to value its environment and natural resources considerably more.

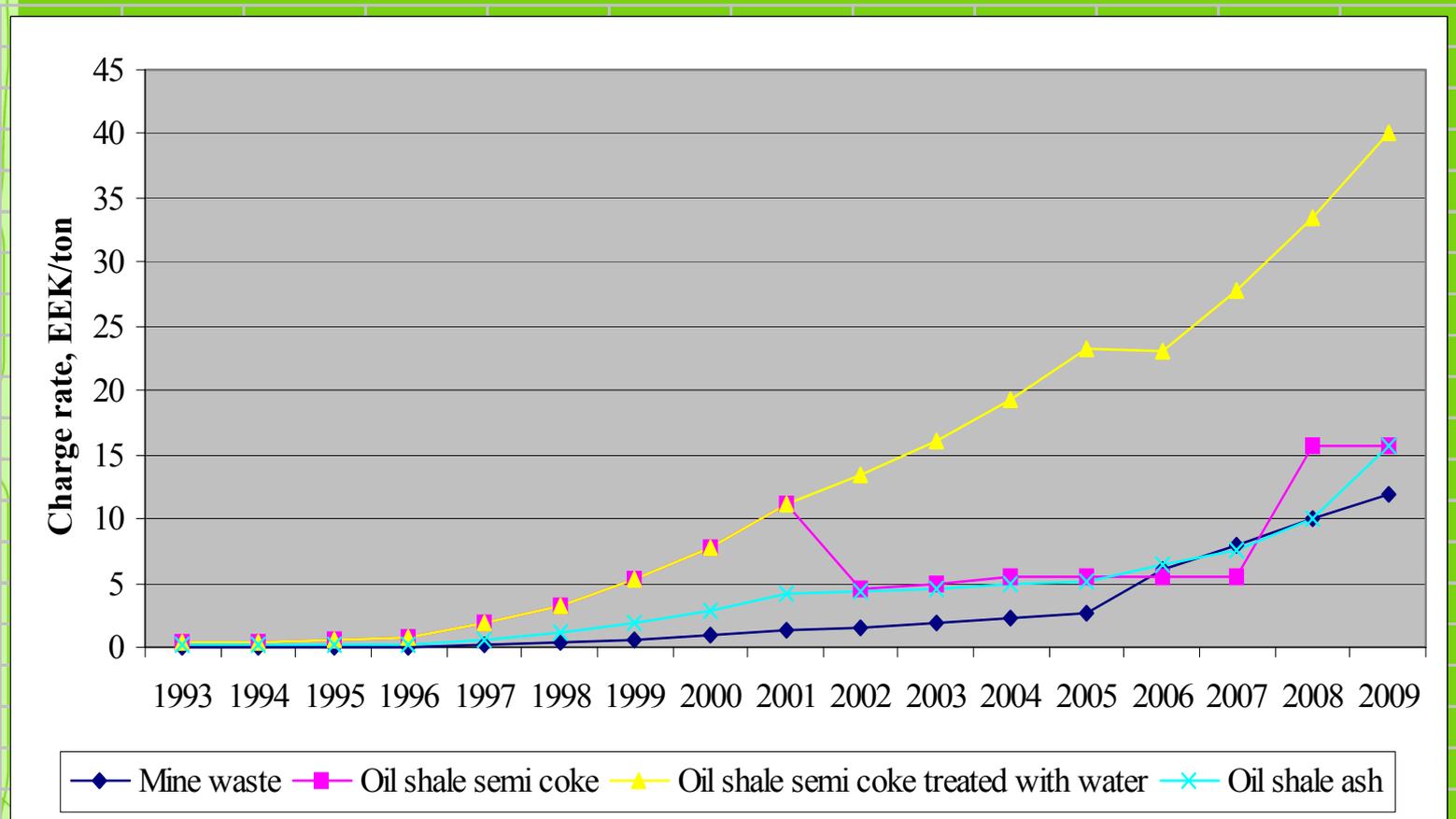
During 1991-2005 the Estonian economy stabilized and the welfare of inhabitants improved, therefore the State does not anymore need to support the population and the economic development at the expense of the Estonian environment.

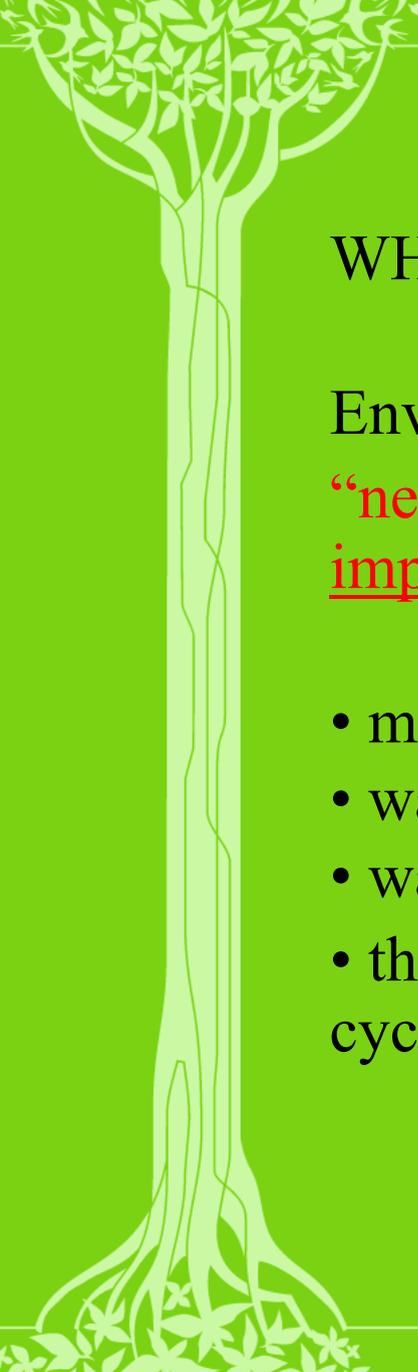
# The dynamics of the selected environmental tax rates:

## 1. Air pollution charges



## *The dynamics of the selected environmental tax rates: 2. Oil-shale waste charges*





## WHAT IS INNOVATION?

Environmental innovation occurs when due to “new ideas” in production process the environmental impact reduces:

- material use is reduced;
- water intake is reduced;
- waste generation is reduced;
- the environmental damage caused throughout the life-cycle of the product is reduced.

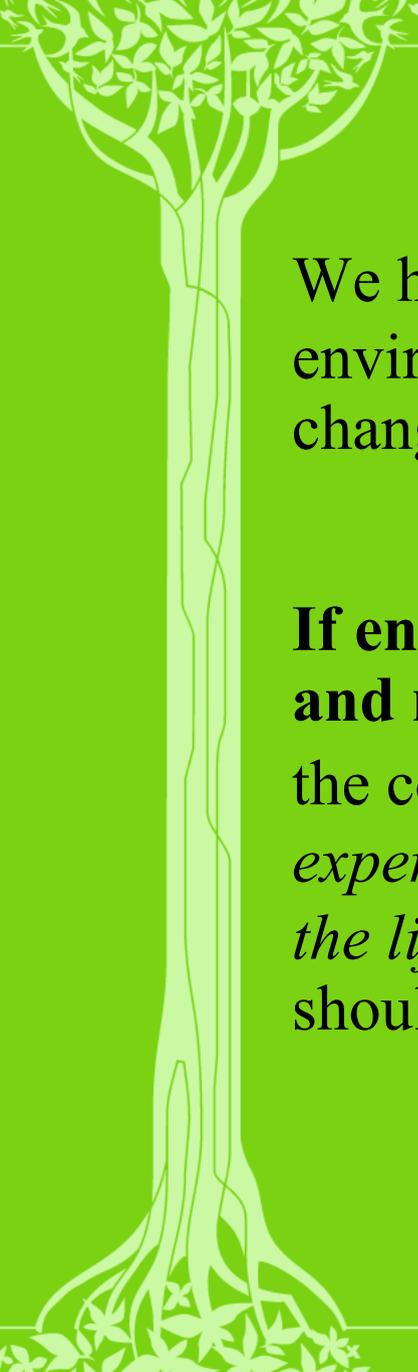


In line with Lisbon Strategy, Estonia is considering the ways to increase its technological level.

The intention is to increase the funding of R&D (3% of GDP). Additional support for environmental innovations is provided by Environmental Investment Centre and Enterprise Estonia.

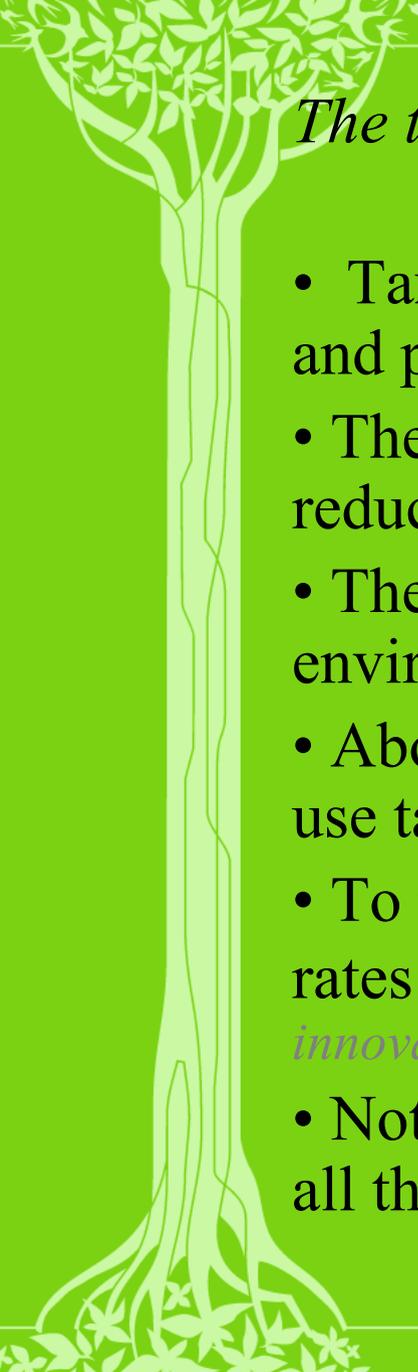
We find that companies themselves need to have the motivation to improve their production technologies and innovate. The best motivator is **MONEY**.

But we think that **GIVING OUT** the money is not the best stimulator.



We have our own method for enhancing environmental protection with the technological change and innovation.

**If environment needs to be protected, pollution and natural resource use need to be taxed i.e.** the common slogan “*environmental protection expenditures and environmental damage throughout the life-cycle need to be included in products price*” should be applied in practice.



*The taxation should be as follows (Estonian method):*

- Tax should be applied directly on natural resource user and polluters, from “zero” pollution or resource use
- The basic tax rate applies in such level that motivates to reduce environmental impact.
- The tax rates are differentiated according to environmental impact;
- Above “allowed” threshold level, pollution and resource use taxed considerably higher rates;
- To increase tax rates gradually and to announce the tax rates for a longer time perspective (*supports technological innovation very well!*),
- Not to apply tax exemptions and allowances, but to treat all the environment users equally.

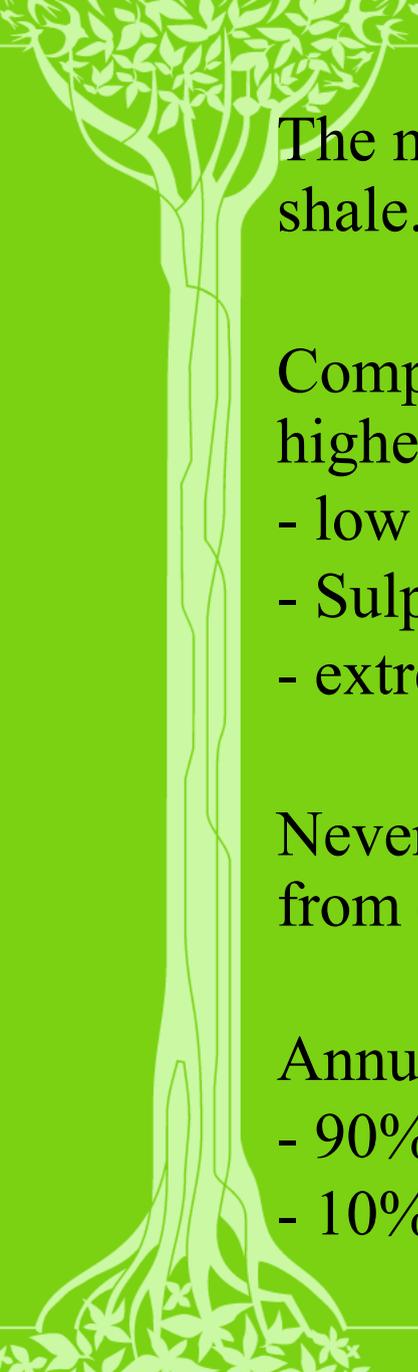


The goal of the Estonian ETR is to:

create a basis to reduce environmental damage from energy sector, to increase effectiveness of energy and material use and to support the development of renewable energy.

In Estonia the greatest environmental problems are caused by energy sector, which is causing

- approx. 80% of air pollution,
- 82% of dangerous waste (6.1 million ton),
- using 80% of ground- and surface water (1.26 million m<sup>3</sup>).



The most important local energy resource in Estonia is oil shale.

Compared to other fossil fuels oil shale has considerably higher environmental impact:

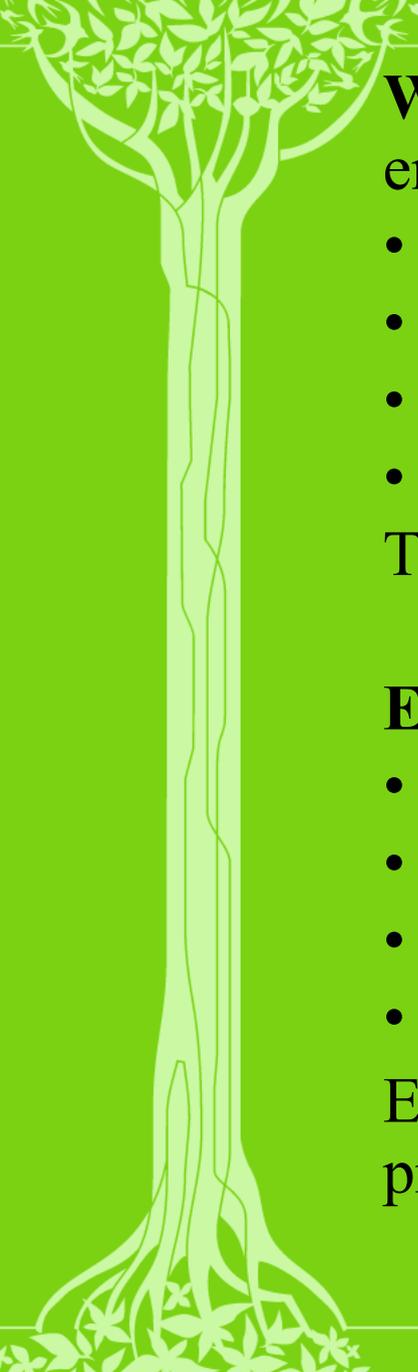
- low calorific value (4-20 Mj/kg),
- Sulphur content (1-2%),
- extremely high ash content (35-70%).



Nevertheless, 98% of the Estonian electricity is produced from oil shale and all of the locally produced oil shale oil.

Annually approx. 15 million tons of oil shale is mined:

- 90% is use for electricity production,
- 10% for shale oil production.



**When mining oil shale**, the company needs to pay environmental taxes on:

- oil shale extraction;
- water abstraction;
- mining waste disposal;
- water pollution

TOTAL 15-18 % of oil shale price

**Electricity producer pays** environmental taxes on:

- water abstraction for cooling water;
- air pollution;
- waste deposit;
- water pollution

Environmental taxes account for 15% of electricity producer price

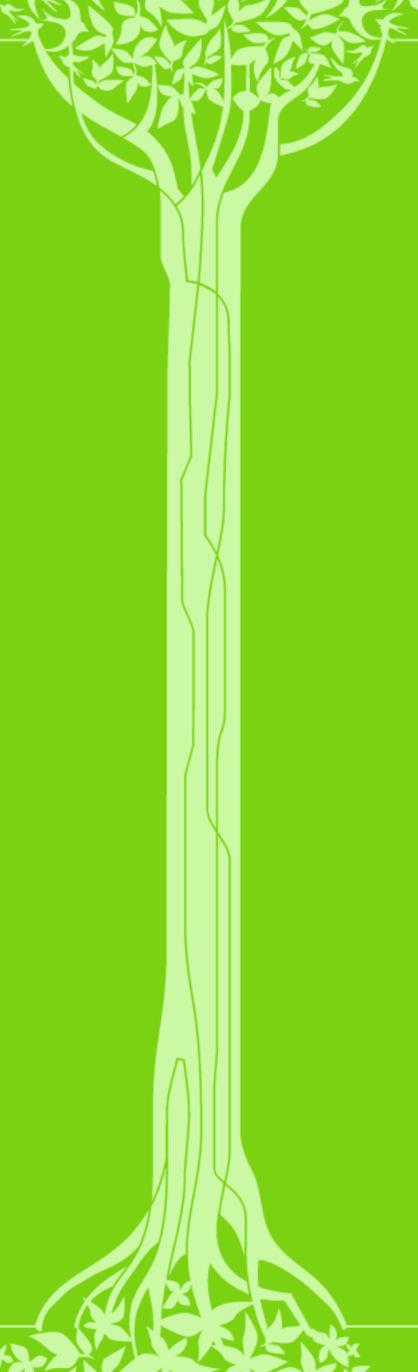


## Oil shale oil producer pays:

- all the oil shale mining related environmental taxes, included in the shale price,
- oil production waste charge (mostly semi-coke),
- SO<sub>2</sub> emission tax (after combustion of generated gas)

The share of environmental taxes in energy products are considerably high. And they are increasing!!

Estonian local producers are **EXTREMELY interested in being COMPETITIVE in an OPEN market**, because environmental taxes are not added on energy price in most countries.



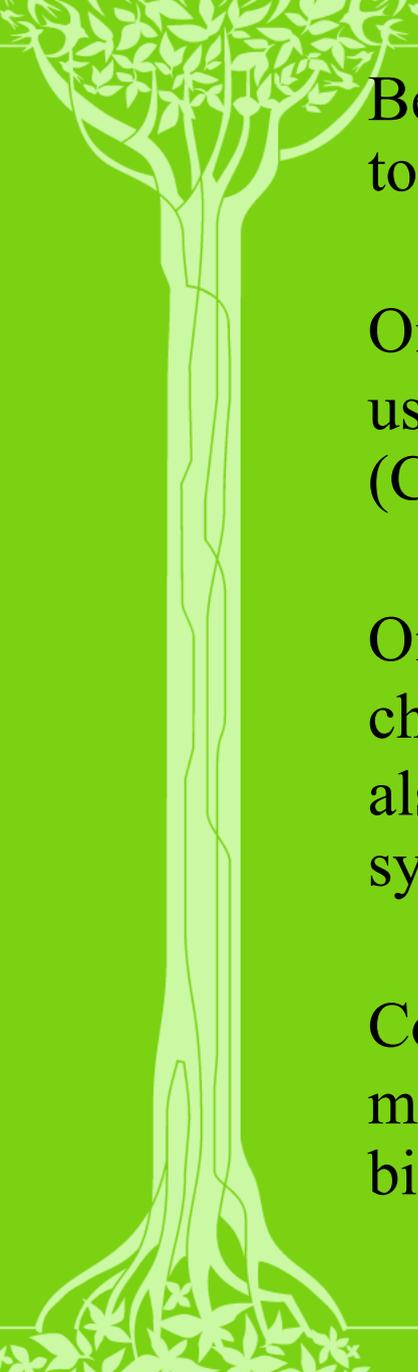
**BUT: Within the Ecological Tax Reform, Estonia plans to value even more its natural resources and environment, as well as support technological innovation in environmental field.**



## How can it be realized in energy sector?

- To achieve potentially maximum and as effective as possible use of mined natural resource.
- To achieve high efficiency of natural resource use, the power generation technology has changed:  
The pulverized firing (PF) in the existing oil shale power plants are replaced with the innovative fluidized bed combustion (FBC) technique.

The effectiveness of the electricity production increased 6-7%, SO<sub>2</sub> and NO<sub>x</sub> emissions reduced remarkably.



Because of enormous amounts of waste the waste needs to be made use of.

Oil shale ash and CO<sub>2</sub> emissions – there is possibility to use oil shale ash deposit as Carbon Capturing Storage (CCS).

Oil shale ash formed in the firing process has a high chemical potential for the mineral sequestration of SO<sub>2</sub>, also CO<sub>2</sub>. Already now the existing ash management system is actually functioning as a sort of CCS facility.

Combination of different possible technologies and more extensive use of the deposit area can give the CO<sub>2</sub> binding rate higher than 20% from emitted total CO<sub>2</sub>.

# Oil shale oil production scheme

TRADITIONAL  
INNOVATIVE  
APPROACH  
APPROACH

resource  
extraction costs

oil shale

**HIGHER  
VALUE  
CHEMICAL  
PRODUCTS**

oil shale  
OIL

install gas  
capture  
equipment  
**HEAT +  
ELECTRICITY**

investment +  
maintenance  
costs

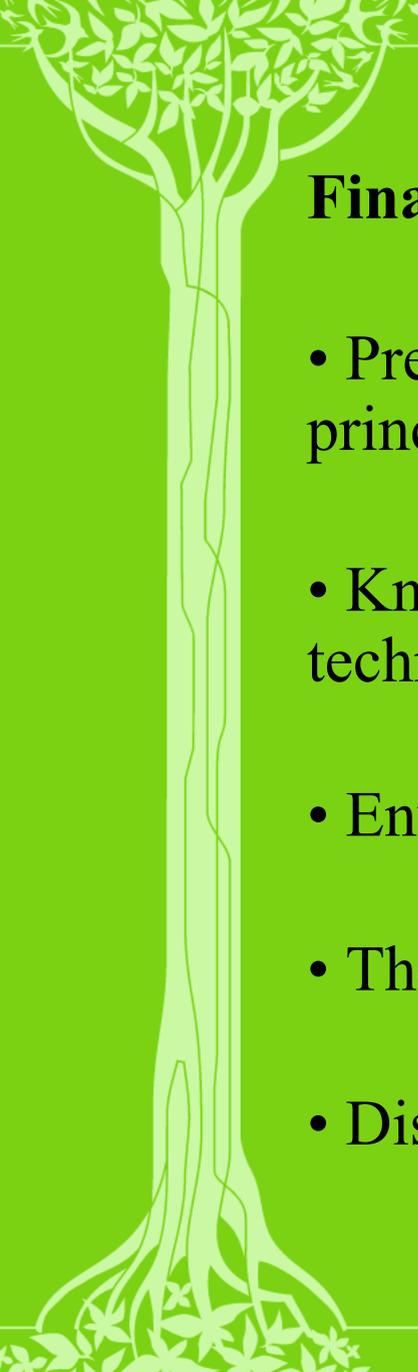
+ generator gas  
+ semicoke

burned  
**build a  
landfill:**

investment +

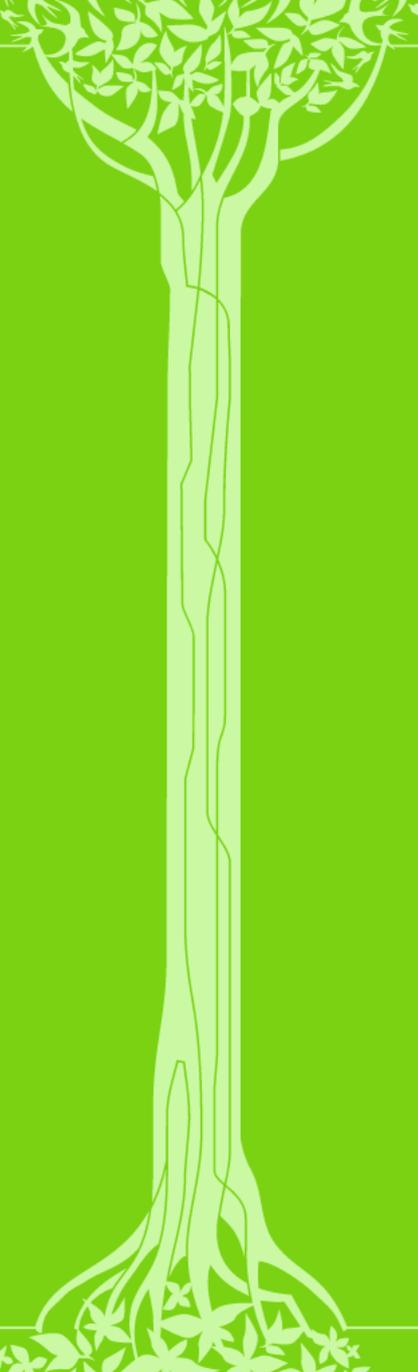
**CEMENT**  
maintenance  
costs

**EU regulations: SO<sub>2</sub> emission  
norms from 2008; mid-2009  
use of only these landfills  
that meet the requirements**



## **Final comments:**

- Presently preparation of environmental taxation principles until 2020
- Knowledge of development possibilities of technologies
- Environmental taxes need to be high enough!
- Thorough analysis and calculations
- Discussions with stakeholders



# Thank you!

Contact: Silja Lüpsik and Eva Kraav  
Ministry of the Environment  
Department of Development  
Estonia

E-mail: [Silja.Lupsik@envir.ee](mailto:Silja.Lupsik@envir.ee); [Eva.Kraav@envir.ee](mailto:Eva.Kraav@envir.ee)