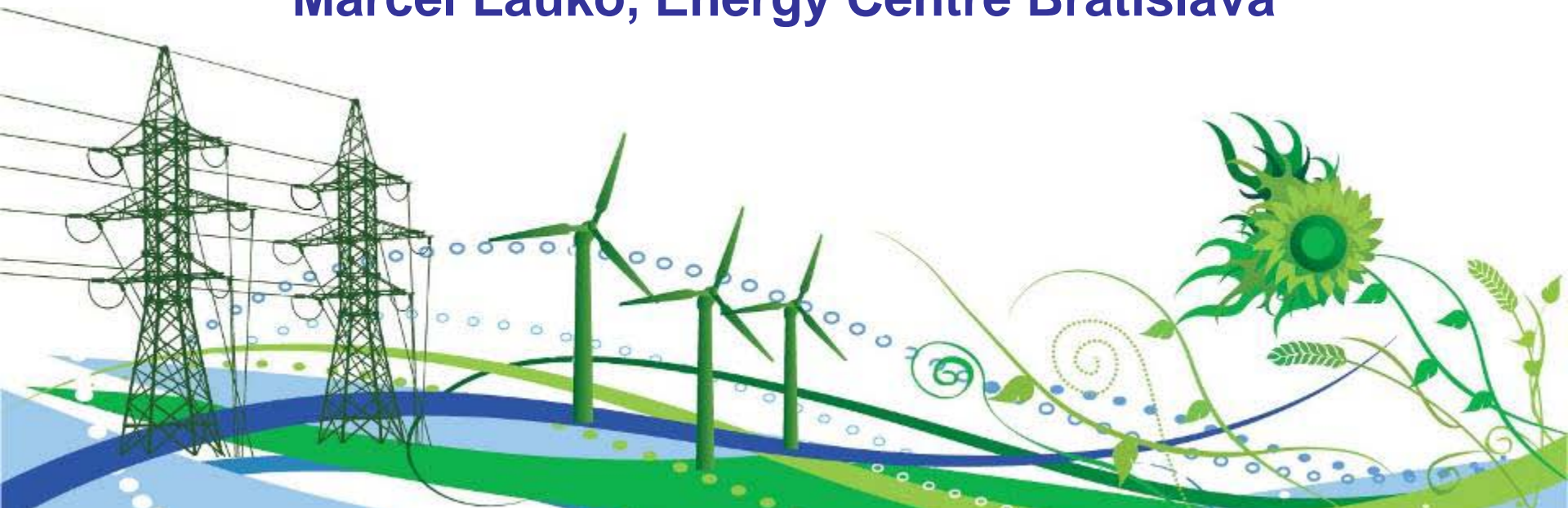


# Sustainable Energy Technology at Work - SETatWork

## SET opportunities in Slovakia

Marcel Lauko, Energy Centre Bratislava



# SLOVAKIA

## ETS Country Overview

- Slovakia is a country with a shortage of indigenous energy sources and, therefore, over 90% of primary energy sources have to be imported.
- Relatively favourable energy mix in terms of emissions due to the high proportion of nuclear power (34%) and considerable share of hydro-electricity.

# SLOVAKIA

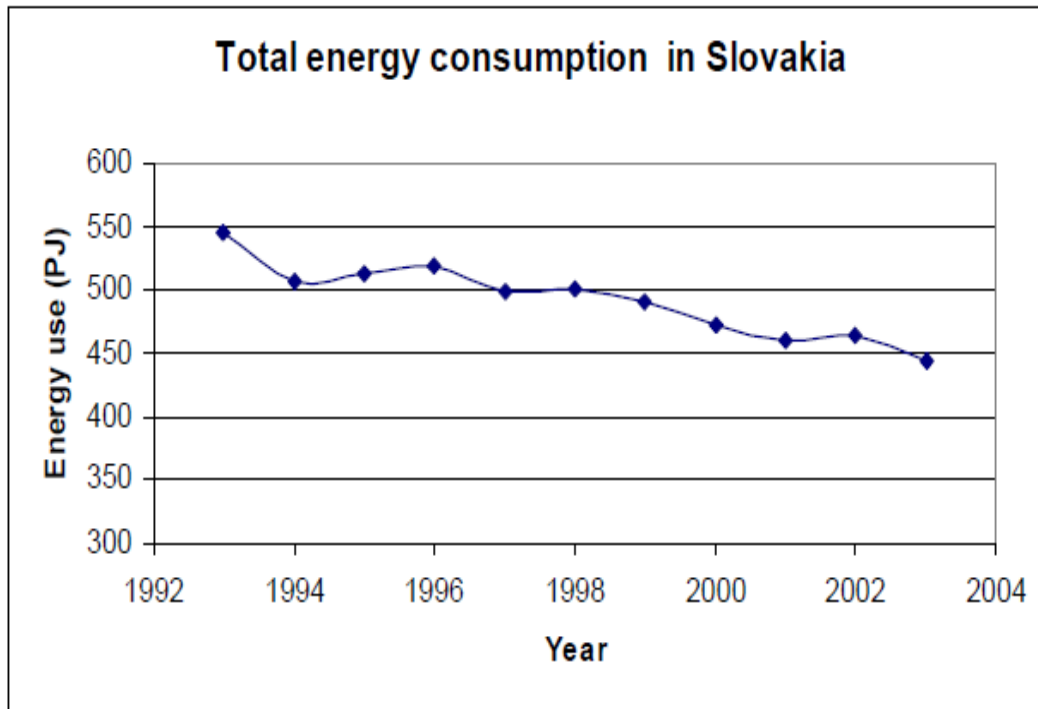
## ETS Country Overview

### Slovakia Energy Demand Key Indicators (2004)

	<b>Slovakia</b>	<b>EU-27</b>
Energy per capita (kgoe/cap)	<b>3,458</b>	<b>3,689</b>
Energy import dependency %	<b>67.6</b>	<b>50.1</b>
CO2 Emissions (Mt)	<b>36</b>	<b>4004</b>
CO2 intensity (tCO2/toe)	<b>1.9</b>	<b>2.2</b>
CO2 per capita (kg/cap)	<b>6648</b>	<b>8,180</b>

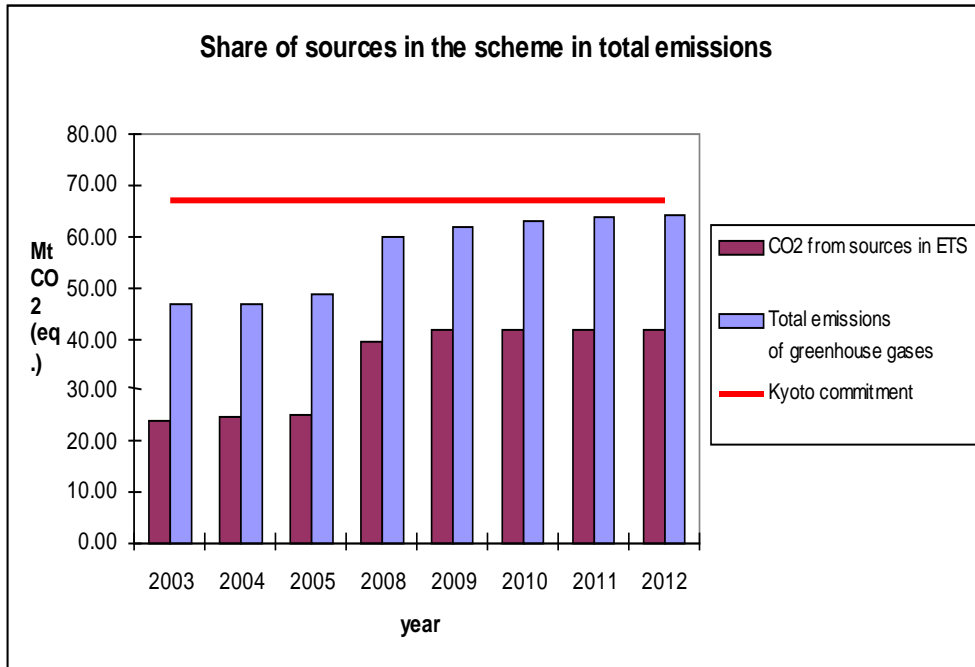
# SLOVAKIA

## ETS Country Overview



Total energy consumption is decreasing steadily in Slovakia due to the gradual implementation of saving measures on the demand site.

Annual energy consumption (PJ) in Slovakia between 1993 and 2003.  
Source: Ministry of Economy



Owing to its climate-friendly energy sector structure Slovakia has lower CO<sub>2</sub> emissions than the EU average.

These emissions decrease steadily.

	CO <sub>2</sub> kg/cap
1990	11,500
1995	8,000
2000	7,300
2005	7,300

Source: National Allocation Plan of the Slovak Republic for the 2008-2012 period (July 2006)

# SLOVAKIA

## ETS Country Overview

According to the Ministry of Economy, about 18 bn EUR is to be invested in the Slovak power production industries by 2030. The investment will be distributed as follows:

- 44% renewable sources,
- 35% nuclear power,
- 15% thermal power plants and about
- 5% at the Ipeľ hydroelectric power plant.

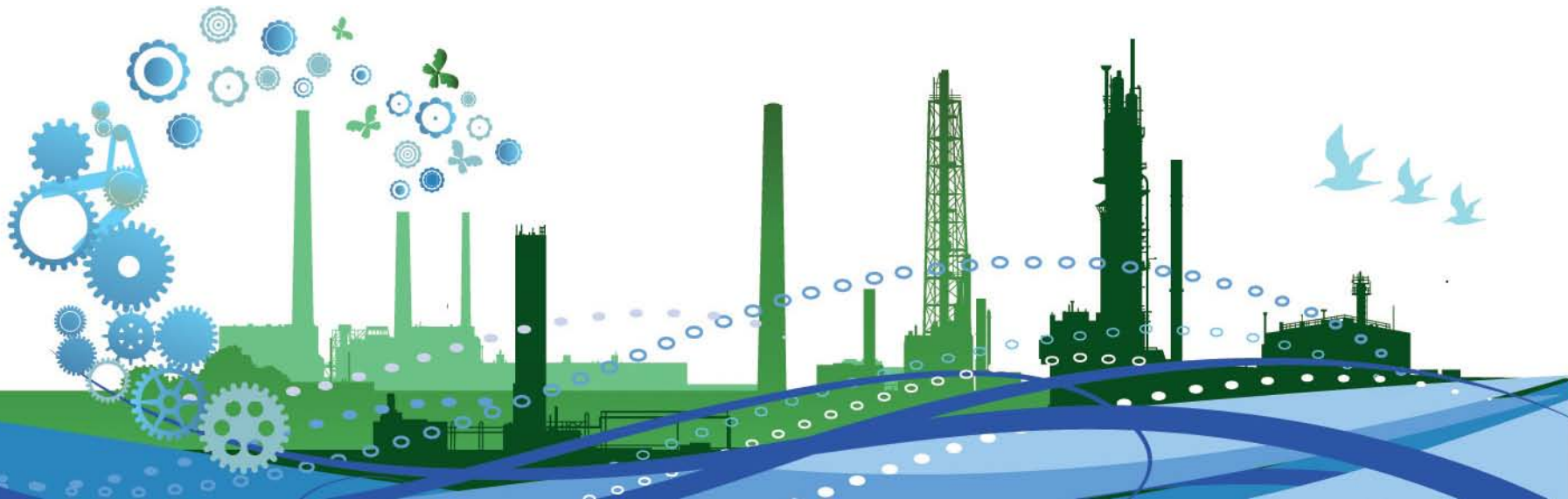
Three general issues are defined in the plan:

- efficient and reliable supplies by all energy sources
- reduction of energy consumption and,
- creating capacities to cover the whole economy energy demand.

# SLOVAKIA

## ETS Industry Overview

- ETS companies have been divided among two categories, A and B.
- Category A which have been allocated 90 % of all Slovakia allowances comprises 29 companies – the most important stakeholders
- Category A covers 7 industrial branches



# SLOVAKIA

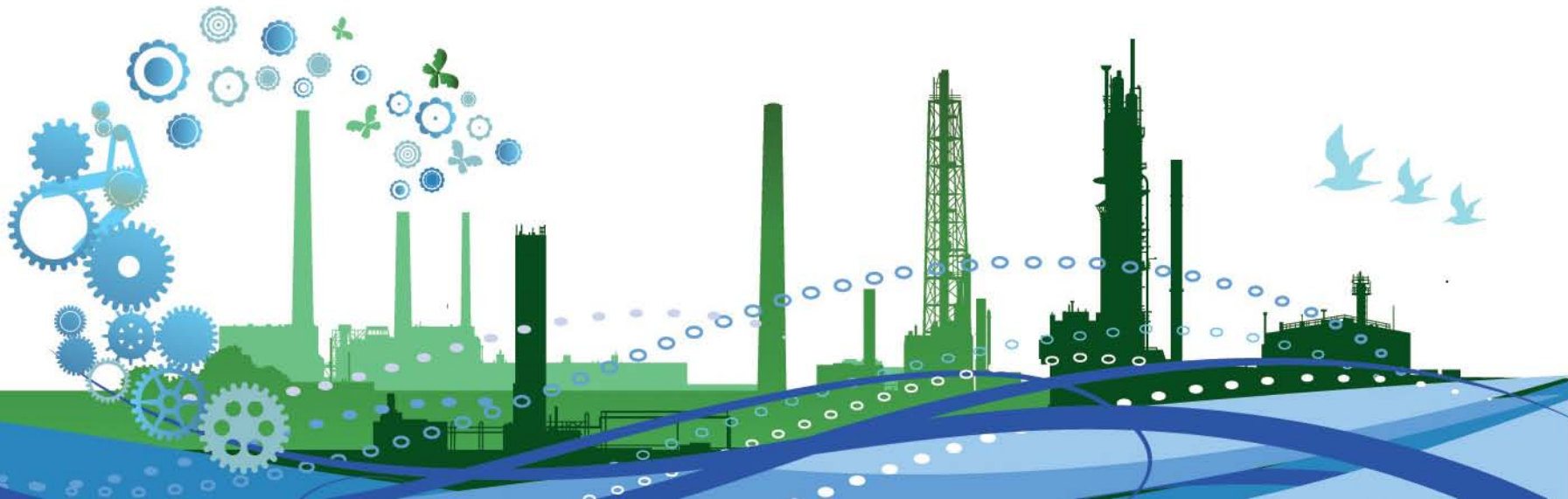
## ETS Industry Overview

- **A1 Thermal energy**

Installations providing heat for inhabitants and the public sector. This category includes five heating plants (Košice, Martin, Zvolen, Bratislava, Žilina)

- **A2 Production of electric and thermal energy**

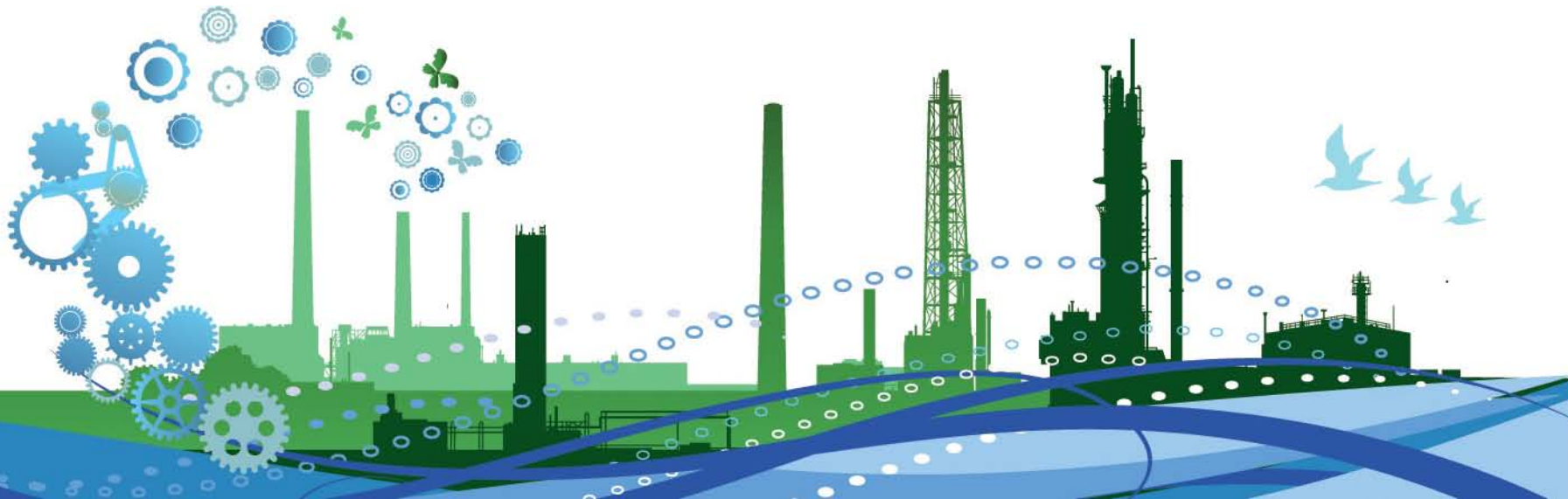
This category includes three companies (Slovenské elektrárne a.s. – ENEL, Slovak Steam-Gas Company in Ruzomberok, Energetika s.r.o. in Strazske)



# SLOVAKIA

## ETS Industry Overview

- **A3 Cement plants and lime works**  
This category includes eight installations
- **A4 Transport of gas**  
This category includes four operations of Slovenský plynárenský priemysel (SPP - Slovak Gas Company)
- **A5 Production and processing of ferrous metals**  
This category includes the biggest emitter in Slovakia, the U.S. Steel co. in Kosice.



# SLOVAKIA

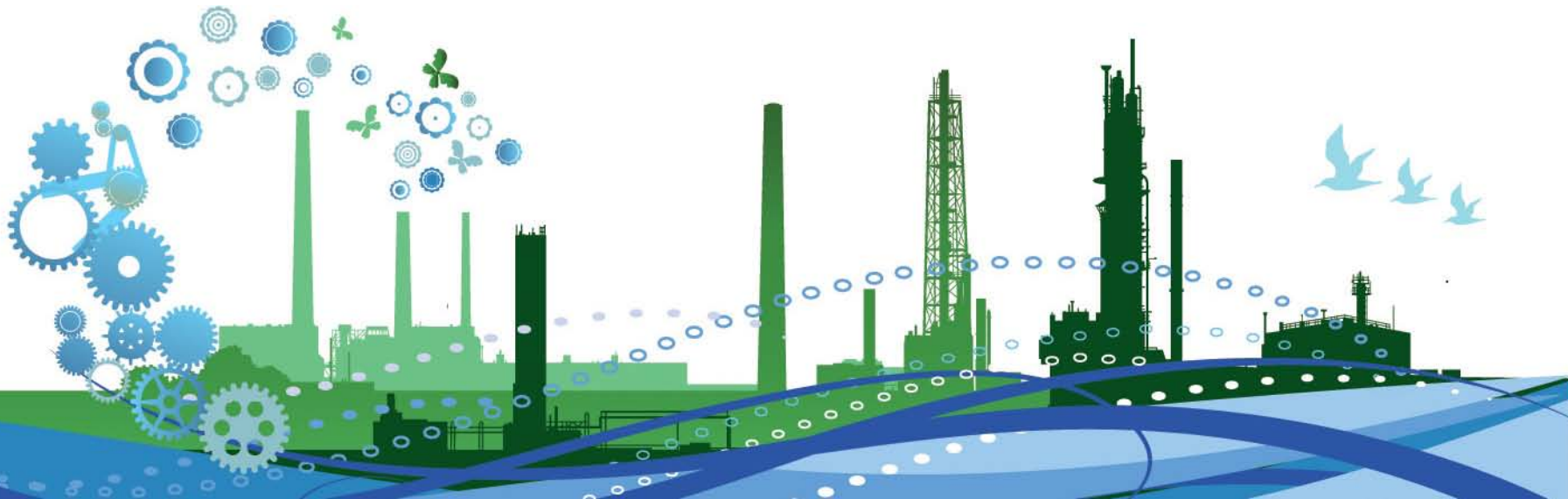
## ETS Industry Overview

- **A6 Production of pulp and paper**

The two main companies representing the pulp and paper industry are KAPPA Štúrovo a.s. and Bukocel a.s. Hencovce.

- **A7 Chemical production, refinery**

This category includes three installations (Slovnaft a.s. Bratislava / energy sector, Slovnaft a.s. Bratislava / refinery, CHEMES a.s. Humenné)



# SLOVAKIA

## - Need & Opportunities

- **By Topic:**

- Fuel switch (especially Heat production)
- Energy efficiency (all industries)
- Energy management systems (all industries)

- **By Industry**

- Power&Heat
- Steel&Iron
- Refinery
- Paper&Pulp
- Cement

# SLOVAKIA

## Good Practice examples

- **Implementation of Biomass-coal Co-firing System in ZVPT Zvolen, (heat & electricity production)**
  - Retrofit of two coal-fired boilers (108 MW each) with a new co-firing system adopted to simultaneous burning of mix of coal with wood chips. Emissions savings 100,000 tCO<sub>2</sub>eq/year
  - More info: [www.zvolenskateplarenska.sk](http://www.zvolenskateplarenska.sk)
- **80 MW Combined Cycle Power Plant, Slovintegra a.s., Levice, (combined heat & power)**
  - Improvement of energy safety and stability of power-grid, via implementation of new medium-range capacity source with quick ramp-up capabilities. Emissions avoided 50,000 tCO<sub>2</sub>eq/year
  - More info: [www.slovintegra.sk](http://www.slovintegra.sk)

# SLOVAKIA

## SETatWork intervention

- **Match Making:**

- **7th International Slovak Biomass Forum, February 2009**  
*topic: Biomass based solutions for heating in industrial and residential sector*

- **Training:**

- **Energy Management Systems, October 2009**  
*within 32nd Conference of Industrial Energy Managers*

- **Project Identification:**

- **Through personal contact, Ongoing**

# SLOVAKIA

## Match-Making activity

### Training & Match-Making Event:

- **Energy Efficiency in Energy Production Sector**

**Date:** February/March (date to be confirmed)

**Venue:** Bratislava, Slovakia

**Target Audience:** Higher and medium-rank management of Power Plants, Heat Plants and other utilities as well as representatives of manufacturers of energy generating machinery and equipment, financing institutions managers, applied science & university experts.



# SLOVAKIA

## Stakeholders & Initiative

- **Key Stakeholders:**

- 29 companies with 90% of allowances allocation
- Ministry of Economy
- Ministry of Environment
- Financial Institutions

- **Initiatives:**

- Complex national approach will depend on final wording of Climate-Energy Package, that is currently prepared by Ministry of Environment
- Programmes focused on EE&RES in residential buildings
- Specific measures in two operational programmes of Structural funds

# **SLOVAKIA**

## **ETS Country Overview**

## **Sustainable Energy Production in Slovakia**

# **Most Remarkable Projects**



# SLOVAKIA

## ETS Country Overview



**Combined Cycle Power Malzenice, to be commissioned in 2012**  
**Highest thermal efficiency in Europe (59% plus)**

# SLOVAKIA

## ETS Country Overview



**Combined Cycle Power Plant Bratislava, the biggest in Slovakia**

# SLOVAKIA

## ETS Country Overview



**Hydro-electric Plant Gabčíkovo, South-West Slovakia,  
Capacity 720 MW, the biggest on the river Danube**

# SLOVAKIA

## ETS Country Overview



### Aquacity

#### Slovakia's Green Water Park Resort

Poprad, Slovakia. a resort that has photocells built in to the glass walls of the complex. The cells generate enough power to operate pool center, a solar-powered, geothermal swimming-pool complex .

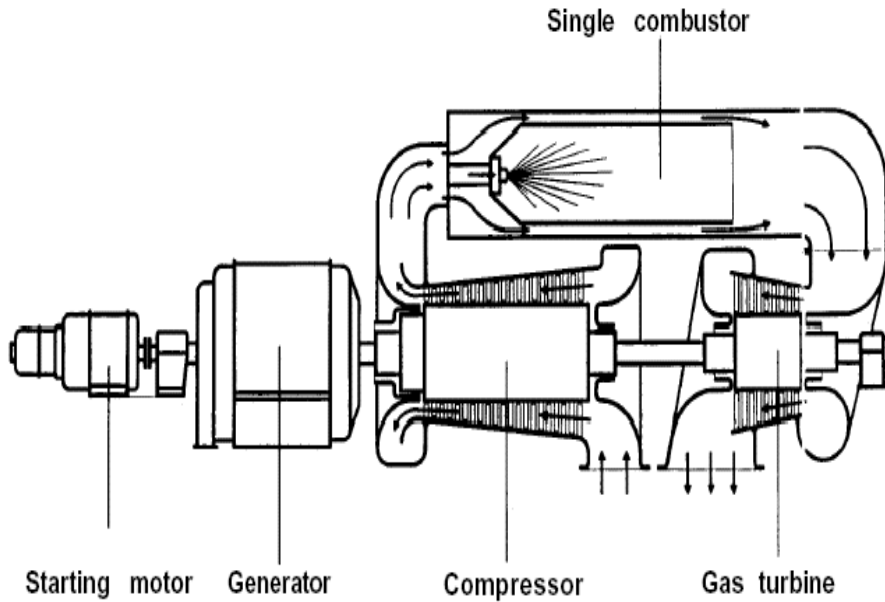
Park uses the resources of wind, water and sun, saving up to 30,000 kg of CO<sub>2</sub> per day. The resort generates 80% of their electrical requirement and gets their water from geothermal water, drilled from a vast subterranean lake.

# SLOVAKIA

## ETS Country Overview



Since 2004, a 2.64 MW **wind park Cerová** has been in operation. 2MW **wind park Skalité** at Čadca is planned for commissioning soon. Before 2010, under present conditions, generating wind power potential of 100 GWh is projected.



**First stationary gas turbine**  
**BBC Brown Boveri, Neuchâtel (1939)**  
**invented by Slovak scientist Aurel Stodola**  
**Still operable...**



**Prof. Aurel Stodola**  
**1859 - 1942**

Find out more about the activities of SETatWork  
and access the SETatWork Database at:

**[www.SETatWork.eu](http://www.SETatWork.eu)**

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