



## **ALF-CEMIND**

# **Alternative Fuels & Alternative Raw Materials in Cement Industry**

## **Project Findings and Results in Bulgaria**

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Sofia Energy Centre

Final Workshop  
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# Introduction



**Area:** *total:* 110,910 sq km

**Population:**

7 718 700 (2005)

**Climate:** temperate; cold, damp winters; hot, dry summers

**Capital:** Sofia (1 096 389 inhabitants, 2005)





# Bulgarian Cement Industry - Background

In Bulgaria up to 1990 (when the country changed from centrally planned economy to market economy) there were six production plants constructed:

- “Devnenski Cement” Plc – Devnia;
- “Granatoid” Plc – Batanovtzi;
- “Plevenski Cement” Plc – Pleven;
- “Vulkan” Plc – Dimitrovgrad;
- “Beloizvorski Cement” – Beli Izvor;
- “Zlatna Panega” Plc – Zlatna Panega, Lovetch Region.





# Present Situation

All Bulgarian cement production capacities were bought and are property of three leading European cement companies.

- Italcementi Group owns:
  - “Devnya Cement” SC;
  - “Vulcan Cement”
- TITAN Cement – Greece owns:
  - “Zlatna Panega Cement”;
- Holcim Group (originating from Switzerland) owns:
  - “Holcim Bulgaria” SC (former Beloizvorski Cement);
  - “Plevenski Cement” SC;
- The factory “Granatoid” Plc, Batanovtzi is not operational any more.





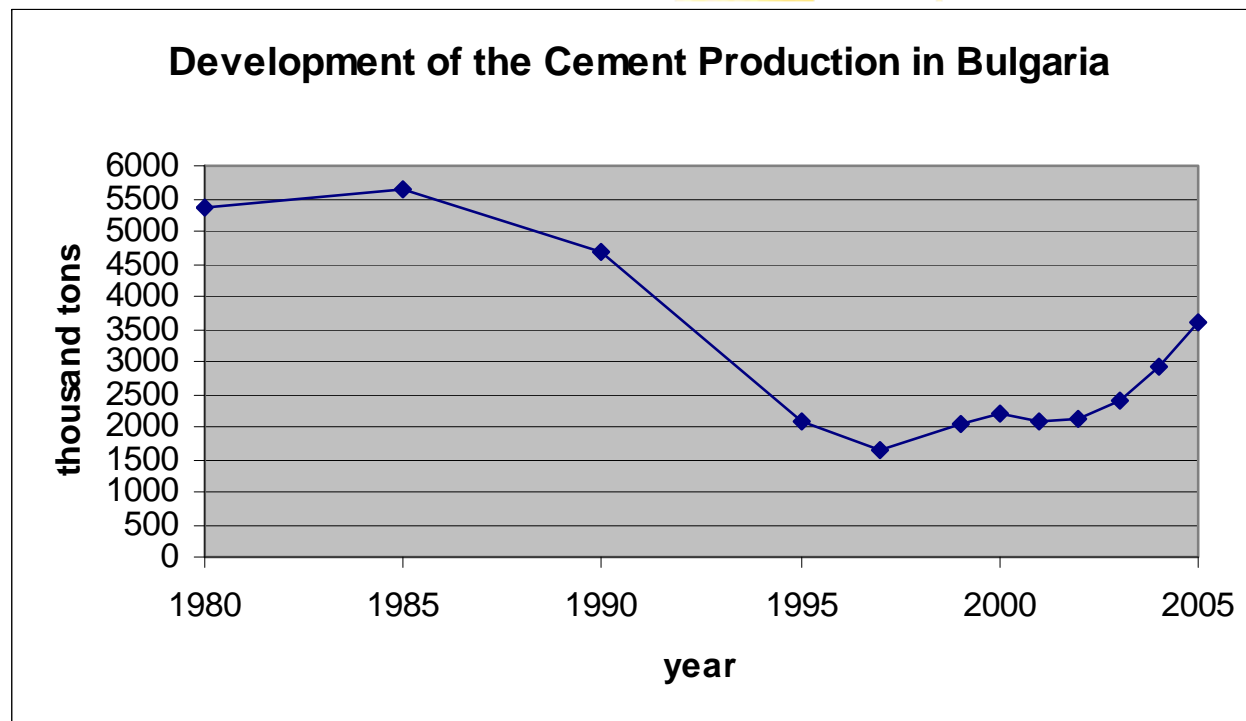


# The Geographical Location of Cement Plants in Bulgaria





# Development of the Cement Production in Bulgaria



Year	1980	1985	1990	1995	1997	1999	2000	2001	2002	2003	2004	2005
Cement production 10 <sup>3</sup> tons	5358	5622	4674	2070	1654	2060	2209	2088	2137	2406	2939	3618





# Status of Cement Plants and Utilization of Wastes as Alternative Fuels and Raw Materials



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# “Devnya Cement” SC



- “Devnya Cement” SC with its production capacity of more than 2 mil. tons of cement is the biggest cement plant in Bulgaria
- In compliance with the policy for sustainable development of Italcementi Group, Devnya Cement SC constantly improves its management. As a result the plant applies certified systems for quality management according to Standard ISO 9001:2000 and for environmental management according to standard ISO 14001:2004.







- According to its complex permit 63/2005 “Devnya Cement” SC has the right to carry out operations for utilization, coded as R1 (use as fuel or otherwise for production of energy) of more than 80 types of wastes classified as alternative fuels.
- In 2007 “Devnya Cement” SC does not use furnace for co-incineration of wastes.





## Experience in Using Alternative Fuels

- „Devnya Cement” SC invested in an installation for utilization of car tires in its main furnace in 2003. This gave opportunity to the plant to deepen its cooperation with the environmental authorities for waste utilization and reduction of the use of fossil fuels.
- This initiative was in compliance with the National Environmental Strategy and Action Plan of the Bulgarian government for 2003 -2007 under the priority “Reduction of the waste quantities”.
- This installation was in operation until the end of 2006. Large quantities of waste have been utilized in it as alternative fuel – old car tires, bone meal, etc.





# The Future of Using Alternative Fuels

- At present Italcementi Group implements investment project “Reconstruction and modernization of the installation for production of clinker and cement in “Devnya Cement” SP plant.
- Forthcoming is the construction of a new furnace for clinker, complying with all requirements for environmental protection and designed to utilize “alternative fuels”, using the new production methods for reduction of possible environmental impacts thus assisting Bulgaria to meet its obligations to EU in this area.





# Vulcan Cement



- Built in 1947 Vulcan is the first cement plant, which is still in operation.
- The client satisfaction, safety and environmental protection are among the highest priorities of Vulcan. These activities are in line with Italcementi Group policy on sustainable development.





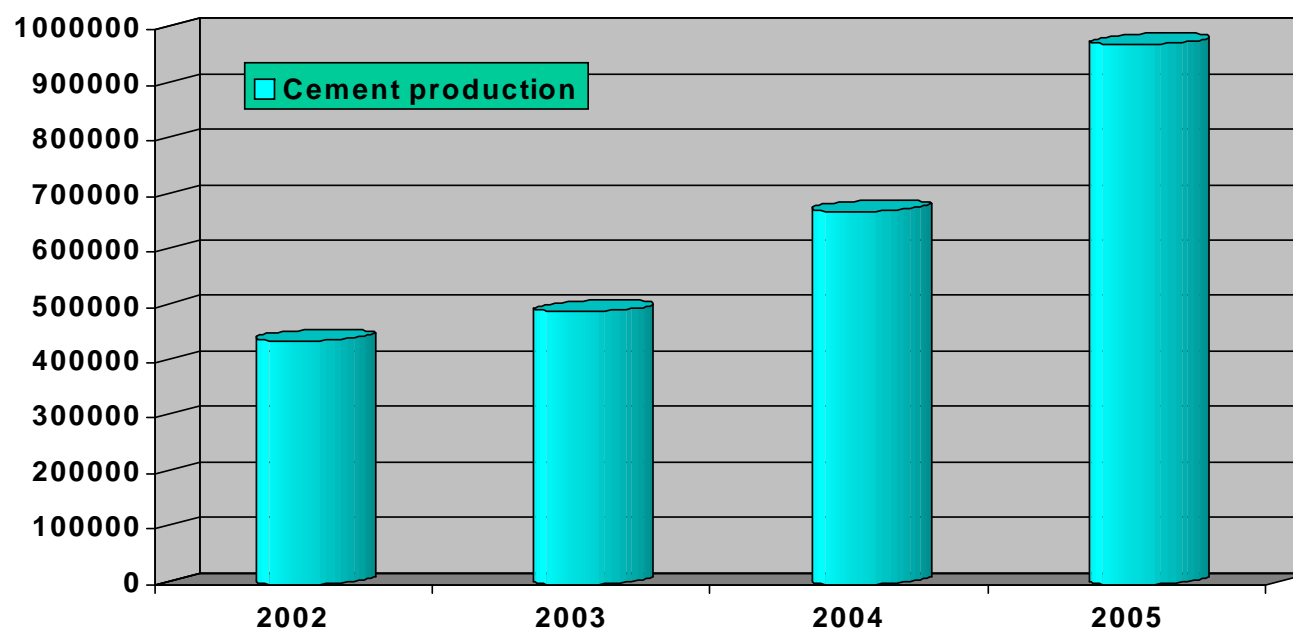
- According to its complex permit 77/2005 “Vulcan Cement” has the right to carry out operations for utilization, coded as R1 (use as fuel or otherwise for production of energy) of 78 types of wastes classified as alternative fuels.
- In 2007 “Vulcan Cement” does not use furnace for co-incineration of wastes.







# TITAN – Zlatna Panega Cement



*Cement production in tons*





## Projects of Zlatna Panega Cement for Utilization of Alternative Fuels and Emission Monitoring

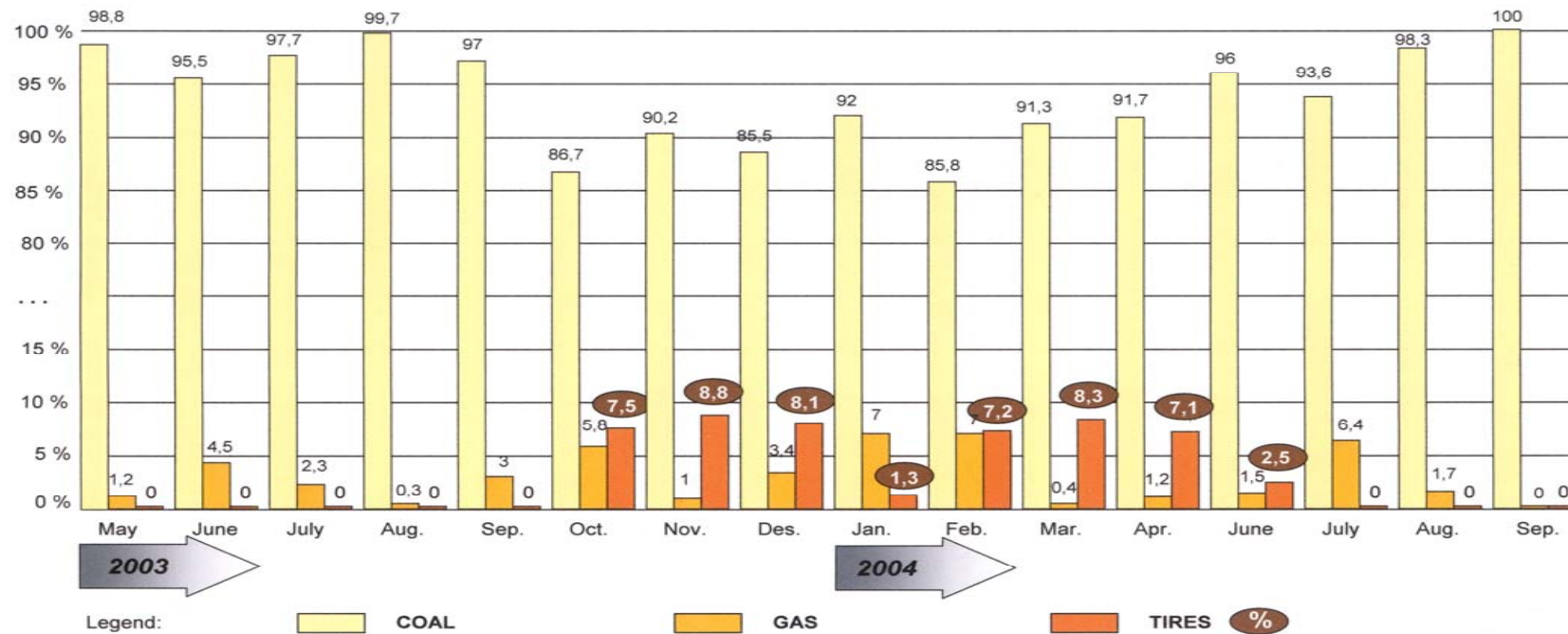


- In January 2003 Zlatna Panega Cement received a permit for co-firing of alternative fuels incl. old car tires, lubricants, waste water treatment plant sludge, etc.;
- In August 2003 – start up of installation for utilization of old car tires;
- The plant applies certified systems for environmental control and monitoring according to Standard ISO 14001;
- Complex permit with a wide range of approved alternative fuels and materials – December 2005.





# Different Fuels Used in 2003 and 2004





## “Holcim Bulgaria” SC (former Beloizvorski Cement)

- Beloizvorski Cement was commissioned in 1960 with two technological lines and consequently during a 30-year period, its capacity has been increased with 4 new lines for reaching of production output of 1 million tons clinker per annum.
- In 1990 seventh technological line is put into operation (still operational) which replaces five of the old lines and thus the capacity of the plant is 800 000 tons clinker per annum.
- In 1997 the company was bought by Holcim Switzerland.
- At present in “Holcim Bulgaria” there is an investment proposal for “Utilisation of car tyres and other types of wastes at clinker production”. It covers utilisation of different fuel mixes, including combinations of coal, waste tyres, plastics, animal meal, solid oil-product wastes, waste oils, wood and mix of municipal solid wastes.





# Plevenski Cement SC

- In 2002 “Plevenski Cement” receives a temporary permit from MOEW for experimenting with utilization of scrap from car tires as additional fuel, and in 2003 introduces to MOEW an investment proposal for technology for utilization of car tires by combustion as an additional fuel for clinker production, amounting to 30 000 Euro. A mechanism for feeding of tire scrap to clinker furnace was constructed.
- The investment proposal is not implemented.
- At present only Plevenski Cement from the Bulgarian cement factories does not have permit for utilization of the wastes as alternative fuels or as raw materials.







# **Basic Analysis of the Opportunities for Use of Alternative Fuels and Raw Materials in the Bulgarian Cement Industry**



The use of alternative fuels and raw materials is a matter of:

- Legislation;
- Investment possibilities for introduction of new technologies;
- Permanent supply of necessary alternative fuels or raw material quantities.





# Basic Analysis

- As regards Bulgarian legislation it has been harmonized with the EU legislation. Four out of five cement plants in Bulgaria have respective complex permits for use of alternative fuels in furnaces. These are: Devnya Cement, Vulcan Cement, TITAN Cement and Holcim Bulgaria (Beloizvorski Cement).
- The leading cement industries have developed respective technologies. It is natural that they do not need external assistance for preparation of feasibility studies, and also that they do not wish to supply internal information. In most of the plants investments have been made for improving their energy situation.
- The third important question when using alternative fuels and raw materials is the management of wastes. Government and local authorities are to play a significant role in this.





# Waste Policy in Bulgaria

- **Legislation**
  - The Law on Waste Management came into force in 2003 (SG 86/30.09.2003). This law regulates the environmentally friendly waste management in terms of generation, treatment and the control over these activities;
- **Ordinances on Waste:**
  - Ordinance No 3 of 01.04.2004 regulates the classification of waste;
  - Ordinance No 6 on the conditions and requirements for construction and operation of incineration plants and co-incineration plants (SG 78/07.09.2004);
- **National waste management program (2003-2007).**





## National Waste Management Program and Action Plan (2003-2007)

In the action plan under the National waste management program it is envisaged:

No	Measure/Activity	Deadline	Responsible institution	Expected costs	Proposed financial sources
2.12	Study the opportunities for waste utilization as alternative fuels in cement plants	31.12.2004	Industry	-	Cement producers
2.13	Reconstruction of existing cement plant for co-incineration of waste, in compliance with the legislation and receiving the respective permits	31.12.2005	Industry	-	Cement producers
2.14	Adoption of incentives for realization of heat/electricity from facilities for waste incineration or those using wastes as alternative fuel	31.12.2005	Ministry of Economics and Energy; Agency for Energy Efficiency; Ministry of Finance; Ministry of Environment and Water	-	-





# Policy on Waste Management

The waste management policy of EU and Bulgaria look at waste utilization in three ways:

- First priority: reduce waste generation;
- Second priority: recycling, reuse and/or acquiring raw materials and energy;
- Third priority: final disposal through landfilling or incinerating of waste which cannot be reduced, reused or recycled.

**The implementation of the priorities will regulate the utilization of waste as alternative source of energy and raw materials.**







# Barriers

- No incentives for realization of heat/electricity from facilities for waste incineration or those using wastes as alternative fuel;
- No incentives for collection and sorting of waste;
- No implementation of the Waste Management Action Plan.





# Conclusion

## for Alternative Fuels and Alternative Raw Materials in the Bulgarian Cement Industry



- Efficient regulations on the use of wastes as fuel;
- Sustainability of supply of the alternative fuels;
- Incentives for investments in existing plans for energy conservation;
- The state through its regulating function should support the waste co-processing in cement kilns, which is a solid waste management policy.





**Thank You  
for  
Your Attention!**



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