



ALF CEMIND

Supporting the use of alternative fuels in the cement industry

FINAL WORKSHOP
Alternative fuels and Alternative Raw Materials In the
Cement Industry

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*Lefki Dimosthenous
Industrial Extension Officer
Energy Service Ministry of Commerce,
Industry & Tourism - Cyprus Institute of Energy*

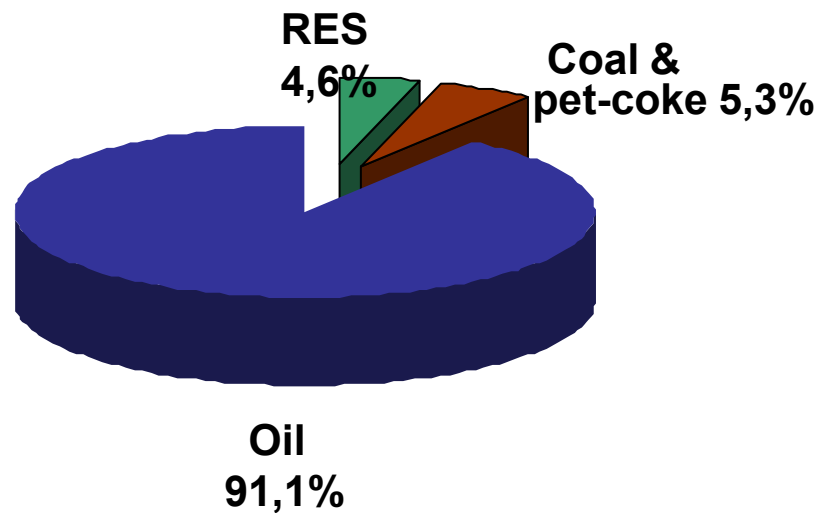
*Christoforos Theophilou
Manager of Vassilikos Cement Works
Public Company Ltd- Cyprus*



ENERGY SITUATION IN CYPRUS



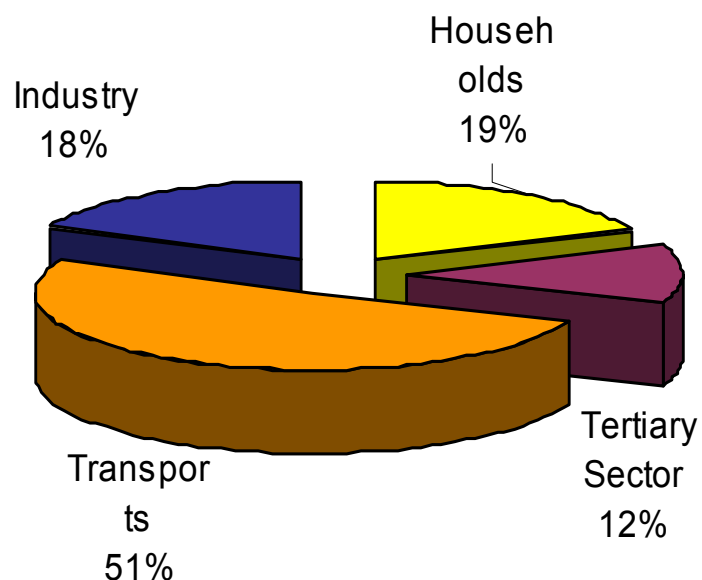
Primary Energy Sources (year 2006)



- Cyprus has no indigenous hydrocarbon energy sources (for the moment)
- Energy system is heavily depended on oil imports for its energy supply (91,1%)
- The remaining covered by imports of pet- coke & coal 5,4% used by the cement industry
- 4,6% by Renewables (mainly solar energy used for heating water in the household and tertiary sector).



Energy Demand (year 2006)



- The Transport sector remains the largest energy consumer (51%)
- In the transport sector the largest energy consumer is Civil Aviation with 35%
- The industrial sector is dominated by the Cement industry which consumes 50% of energy.



Biomass action plan

At present the 6% (1,2% from Biomass) target for RES electricity contribution by year 2010 is considered to be difficult but attainable.

It is envisaged that by proper implementation of the relevant legislation, continues reinforcing and upgrading of the various Grant Schemes and by creating the various mechanisms that will reduce the administrative obstacles, the target will be achieved.



Biomass Action Plan

Aim of the Biomass Strategy

- **Cover the three main axis of the European Biomass Action Plan:**
 - **Biomass for Electricity production**
 - **Biomass for heating and Cooling**
 - **Biofuels for transport**
- **Identify the indicative national targets for electricity production for Biomass and Heating/Cooling**
- **Find ways to reach the obligating target of use of 10% of biofuels in transports by 2020**
- **Covers the use of Biomass from Cement Industries**



COUNTRY STRUCTURE



Description of Cement Industry in Cyprus

**Total Cement production is estimated about
 $1,7 \times 10^6$ tns/ yr from two cement production sites**

There are two cement production sites in Cyprus:

Vasilikos Cement Works Ltd (VWC) – situated in the Vasilikos area

- Semi-dry processes in its operation
- 3 kilns and 5 cement mills
- Convectonal fuels and Alternative fuels

Cyprus Cement Company (CCC) - situated in the Moni area

- Dry processes in its operation
- 2 kilns and 2 cement mills
- Only Convectonal fuels



Alternative Fuels Utilization

Vasilikos Cement Works Ltd (VWC)

6% of energy total consumption

↔ 8400 tns/ yr pet-coke replacement

Replacement of 1050 Kg/hr of pet-coke by AF's
222 Kcal/ sec ↔ 930 KJ/ sec

Cyprus Cement Company (CCC)

Only Convectional fuels



Alternative Fuels Utilization

Vasilikos Cement Works Ltd (VWC)

- * Bone meal 500tns/yr
 - * Sewage sludge (dry) 2000 tns/yr ↔ 6000 tns/yr (70% wet)
 - * Chopped (shredded) tires 6000 tns/yr
- All above AFs are supplied to the cement plant at zero cost



Alternative Raw Materials Utilization

Vasilikos Cement Works Ltd (VWC)

12% ARMs ↔ 160000 tns/yr

* Limestone 80000 tns/yr

* Granulated Slag 80000 tns/yr

Ground in mills with 3rd generation separators

Purchased at 20-25 EUR/tn

Cyprus Cement Company (CCC)

* **12% ARMs ↔ 48 000 tns/yr**

* **Pozzolanic minerals from Greece**

40000-50000 tns/yr ↔ ground in the tube mills



Alf Cemind

Steering Committee

- **Ministry of Commerce, Industry & Tourism-Energy Service**
- **Ministry of the Interior**
- **Ministry of Agriculture Natural Resources and Environment**
- **Ministry of Labor and Social Insurance- Department of Labor Inspection**
- **Cyprus Scientific and Technical Chamber**
- **Cyprus Energy Regulatory Authority**
- **Cyprus Chamber Of Commerce And Industry (CCCI)**



PERMITS

✓ **Department of Labor Inspection: Emission permit (IPPC)**

✓ **Environment Service:**
- **Disposal Permits (IPPC)**
- **Waste Management / Storage & Handling approved**

✓ **Ministry of Interior: Waste Disposal**

Considered that was given urban authorization first



IPPC Permits Department of Labor Inspection

Max allowances - use of Alternative fuels at Vasilikos Cement Works Ltd (2007-2011)

- 10 000 tns/yr used tires
- 20 000 tns/yr sewage sludge (dry)
- 20 000 tns/yr vinassa (process water)
- 7 000 tns/yr Bone meal
- 120 000 tns/yr Green Coal
- 3 000 tns/yr olive seeds

* Max Ratio Alternative/ Convectional Fuel:40%



THE GREEN COAL PROCESS

Feasibility Study (excel file)



TARGET OF VASSILIKO

TO SUCCEED IN HAVING GREEN COAL AS A MAJOR FUEL AT VASILIKO WHILST AT THE SAME TIME SOLVE THE COUNTRY'S BIGGEST ENVIRONMENTAL PROBLEM. ALL RESEARCH HAS BEEN DONE AND SINCE BEGINNING OF NOVEMBER AN INDUSTRIAL DEMONSTRATION IS TAKING PLACE ONSITE. GREEN COAL IS PRODUCED FROM THE ORGANIC CONTENT OF WASTE WITH EXCELENT RESULTS.

YOU ARE ALL INVITED TO SEE THE DEMONSTRATION IN OPERATION WHENEVER POSSIBLE. THE DEMONSTRATION WILL CONTINUE TILL END JANUARY 2008.



THE GREEN COAL PROCESS



PROBLEMS ENCOUNTERED IN AF USE IN CYPRUS

1. SCARCITY OF MATERIALS

2. NO WASTE TO ENERGY COMMITMENT/POLICY BY GOVERNMENT BODIES YET. MUNICIPAL WASTE BELONGS TO MUNICIPALITY AND DECISION ON THEIR UTILISATION GOVERNED BY GOVERNMENT

**3. NO SUBSIDIES FOR COLLECTION AND TREATMENT
(eg. Tires, MSW, greenhouse PE films, sewage sludge)**

4. PROTESTS FROM NEIGHBOURHOODS WHO ARE DRIVEN BY CERTAIN "NO-GOOD WILLINGNERS" WHO PROMOTE THEIR OWN INTERESTS.

5. CONTRARY TO ECOLOGISTS WHO ARE VERY OK IN WASTE TO ENERGY POLICY OTHER POLITICIANS ARE NOT POSITIVE. THERE ARE NO TECHNOCRATS TO PRESS OTHERS IN THE PARLIAMENT.



Key Decision Factors

- ✓ **Economic and financial sustainability?**
- ✓ **Technical Sustainability & product quality?**
- ✓ **Environmental/ Ecological sustainability?**



Thank you for your attention

Contact us...

**Energy Service Ministry of Commerce,
Industry & Tourism & Cyprus Institute of
Energy**

**13-15 Araouzou Str,
1421 Lefkosia**

Tel: +357 22 409340

Fax: +357 22 304759

www.mcit.gov.cy

www.cie.org.cy