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# REFERENCES

## Consultancy Services for the Cement Industry & Industrial Minerals

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**AUSTROPLAN**  
AUSTRIAN ENGINEERING GMBH

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## REFERENCES

### Consultancy Services for the Cement Industry & Industrial Minerals

| Client<br>Country                           | Project  | Year            |
|---|--|-----------------|
| AL JOUF Cement Com-<br>pany<br>SAUDI ARABIA | <b>Cement Plant Expansion 5,000 tpd</b><br><br>The cement factory has been established near Turaif in the northern part of the Kingdom of Saudi Arabia located close to the Saudi, Jordanian and Iraqi borders. The extension project of the existing plant (5,000 tpd clinker) entails adding a new line of 5,000 tpd clinker production capacity including extension of captive power plant. The EPC contract for cement production line has been awarded to CDI-Sinoma end of 2011. The supplier of new power plant is Wärtsila.<br><br>Austroplan started with review of tender documentation and assistance in contract negotiations. Austroplan's services include project management services, approval of contractor's design and fulltime supervision of the construction site. | 2012<br>to date |
| N.N.<br>MAKKAH REGION<br>SAUDI ARABIA       | <b>Greenfield Cement Plant</b><br><br>Preparation of Tender Documentation and support in contract negotiations with turn-key Contractors for a new cement plant in the Makkah region of the Kingdom of Saudi Arabia.   | 2012<br>to date |
| ARAB POTASH<br>COMPANY<br>JORDAN            | <b>Investigation and Redesign of a Dedusting System</b><br><br>Performing of a site survey and dust measurements at the drying and sieving section of a hot leach plant with 4,800 t/d of potash production. Engineering of a new dedusting system. Elaboration of the technical tender specifications for the installation of the new dedusting system including filters, fans and piping.  | 2011-<br>2012   |
| PALANCA<br>ANGOLA                           | <b>Greenfield Cement Plant</b><br><br>Preparation of Tender Documentation and support in contract negotiations with turn-key Contractors for a new cement plant in South Angola.   | 2011            |

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### Consultancy Services for the Cement Industry & Industrial Minerals

| Client<br>Country              | Project  | Year         |
|--------------------------------|--|--------------|
| CEMMAC AS<br>SLOVAKIA          | <b>Revaluation of Residual Asset Life</b><br><br>The aim of the project was to evaluate the cement plant after considerable revamping and modernisation. In co-operation with the client a model was developed where the book value of each single department was revalued based on its performance increase and referenced to international benchmarks.   | 2010-2011    |
| SINJAR Cement Plant<br>IRAQ    | <b>Engineering &amp; Consulting Services for Plant Rehabilitation</b><br><br>Services including plant audit, evaluation and verification of the existing equipment, elaboration of the process technology and plant design for the rehabilitation project, preparation of investment budget, preparation of the tender documents, floating of tenders, evaluation of offers and preparation of contracts between suppliers and the client  | 2010 to date |
| N.N.<br>OMAN                   | <b>Basic Engineering for Plant Upgrading</b><br><br>Elaboration of process engineering, layouts, flow-sheets and technical specification for equipment supply, erection and start-up services for the upgrading of the existing plant from 2,000 t/d up to 3,000 t/d clinker capacity  | 2010         |
| Libyan Cement Company<br>LIBYA | <b>Benghazi Raw Mill No. 3 Turn-key Upgrading Project</b><br><br>Engineering services including engineering, equipment supply, erection and start-up services; the main project target was to increase the raw mill system capacity from 80 t/h up to 160 t/h, the major tasks to be executed were the modification of the ball mill, implementation of a static separator into the system and installation of the bucket elevator in order to provide smooth material supply; the successful execution was carried out during 2.5 months (as part of kiln line No. 3 upgrading) | 2010 - 2011  |

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| Client<br>Country                                | Project  | Year            |
|--|--|-----------------|
| ATUK<br>Cement Holding AG<br>UKRAINE             | <b>Feasibility Study for a Greenfield Cement Plant</b><br><br>Preparation of a feasibility study for the construction of a state-of-the-art dry process cement plant with 2,500 t/d clinker capacity in Eastern Ukraine; including raw materials investigation, market survey and plant design for the production of ordinary Portland and slag cement; assistance in the acquisition of land, license and permits for quarry development and plant construction   | 2009            |
| Libyan Cement Company<br>LIBYA                   | <b>Benghazi Raw Mill No. 2 Upgrading Project</b><br><br>Elaboration of mills improvement study with recommendations for future step; execution of upgrading project - including engineering, equipment supply, erection and start-up services; the main project target was to increase the raw mill system capacity from 80 t/h to 140 t/h; the major tasks to be executed were the modification of the ball mill and implementation of a static separator into the system; the successful execution was carried out during a period of 40 days of kiln stoppage | 2009            |
| ATRUS<br>Cement Holding AG<br>RUSSIAN FEDERATION | <b>Project Development for a Greenfield Cement Plant</b><br><br>Greenfield project for construction of a cement plant with capacity of 6,000 t/d of clinker; carried out up to now or in progress: geological exploration (completed), resources evaluation according to the Russian law, feasibility study preparation (completed) and mine planning  | 2008 -<br>2012  |
| Yanbu Cement Company<br>SAUDI ARABIA             | <b>Cement Plant Expansion</b><br><br>Project implementation monitoring consultancy, including supervision of construction of one production line with a capacity of 10,000 t/d clinker for the production of 3,500,000 t/y ordinary Portland cement at Yanbu, Saudi Arabia; the project includes an overland conveyor belt from the quarry to the plant  | 2008<br>to date |

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### Consultancy Services for the Cement Industry & Industrial Minerals

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|                                  |   |      |
|----------------------------------|---|------|
| Viru Keemia Grupp<br>ESTONIA     | <b>Cement Plant</b><br><br>Preparation of tender documents based on the technical opportunity study with special emphasis of the partial use of kerogenous raw mix components (dual kiln feeding) for the construction of a 2,500 t/d cement plant for the manufacture of Ordinary Portland Cement with reduced fuel consumption due to the partial utilization of kerogenous materials in modified dry-process technology  | 2008 |
| Libyan Cement Company<br>LIBYA   | <b>Cement Plant Expansion</b><br><br>Preparation of feasibility study and tender documents, evaluation and analyzing of offers, assistance during negotiations with contractor and project implementation monitoring consultancy incl. supervision of construction and commissioning of a new production line with a capacity of 7,500 t/d clinker  | 2007 |
| Kaz Cement Company<br>KAZAKHSTAN | <b>New Cement Plant</b><br><br>Preparation of a feasibility study, plant engineering and tender documentation for a new cement plant with an intended capacity of 1,300,000 metric tonnes p.a. of Ordinary Portland Cement in Almaty, Kazakhstan  | 2007 |
| Viru Keemia Grupp<br>ESTONIA     | <b>Cement Market Study</b><br><br>Elaboration of a market study evaluating currently used production processes and technologies including plants using oil-shale, an overview of the aggregated work cement market, quantitative analyses of the cement market and forecasts for extensive surrounding regions; the study also integrates factors such as price development analyses, restrictions, extensive information on sales and transport logistic and recent developments and forecasts of cement trading | 2007 |
| Viru Keemia Grupp<br>ESTONIA     | <b>Inputs into Environmental Impact Assessment</b><br><br>Investigations regarding basic engineering, technological concept including the process description, plant specification, and plant layout among others; investigation of potential environmental impacts during the operational phases of the new cement plant   | 2007 |

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### Consultancy Services for the Cement Industry & Industrial Minerals

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|                                      |   |                |
|--------------------------------------|---|----------------|
| Viru Keemia Grupp<br>ESTONIA         | <b>Cement Plant</b><br><br>Technical opportunity study including comparative capacity options and cost estimates for the construction of a cement plant at a shale-oil refinery; the dry-process plant concept has been based on the partial use of kerogeneous raw mix components (dual kiln feeding) and the use of shale-gas as primary fuel   | 2006           |
| LSR-Group<br>RUSSIA                  | <b>Cement Plant</b><br><br>Preparation of tender documents (semi-turnkey) based on opportunity study and due-diligence survey, including raw materials exploration for the construction of a 1,800,000 t/y cement plant near St. Petersburg for the manufacture of ordinary Portland cement with reduced fuel consumption due to partial utilization of kerogeneous depot materials available from previous mining and processing of oil-shale as alternative raw mix components in modified dry-process technology | 2006           |
| British Sugar<br>UNITED KINGDOM      | <b>Laboratory Research</b><br><br>Investigations at laboratory scale for the small-scale production of Portland cement clinker with the use of precipitated calcium carbonate (PCC) sludge and silt, both rejects from the processing of sugar beets  | 2006           |
| Yemeni Saudi Cement Company<br>YEMEN | <b>Assistance in Cement Plant Design</b><br><br>Review of basic design of a dry-process cement plant with a capacity of 3,000 t/d clinker at Batais village in Abyan province (100 km from Aden) and updating the feasibility study prepared by AUSTROPLAN (1997)   | 2005           |
| Saudi Cement Company<br>SAUDI ARABIA | <b>Cement Plant Expansion</b><br><br>Preparation of tender documents and project implementation monitoring consultancy, incl. supervision of construction of two production lines with a capacity of 2x 10,000 t/d clinker for the additional production of 6,600,000 t/y ordinary Portland cement and sulphate resistant cement at Hofuf, Saudi Arabia; the project includes an 8.8 km overland conveyor belt from the quarry to the plant   | 2004 -<br>2010 |

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### Consultancy Services for the Cement Industry & Industrial Minerals

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|   |  |      |
|---|--|------|
| Southern Province Cement Company<br>SAUDI ARABIA  | <b>Cement Plant</b><br><br>Supervision of project implementation for a new Greenfield cement plant with a capacity of 5,000 t/d clinker constructed in the mountains at Tahamah, Southern Saudi Arabia; supervision of the Chinese general turn-key contractor; the project includes a captive power plant, 10 km water pipeline from the new water wells and all ancillary buildings and access roads   | 2004 |
| Dangote Industries Ltd.<br>NIGERIA<br>in coordination with<br>The Worldbank (IFC)<br>and the European Investment Bank (EIB) | <b>Cement Plant Completion</b><br><br>Fact-finding mission, market assessment, due-diligence survey and project implementation monitoring consultancy as the "Lenders Engineer" under international financing for completion of a cement plant project of 2 x 2,200,000 t/y ordinary Portland cement at Obajana, Kogi State; the project also includes a captive power plant of 76 MW with 90 km extension of a natural gas pipeline, tapping at the Ajaokuta steel mill, the construction of a water dam and 7 km overland belt conveyor from the quarry to the plant | 2004 |
| Al-Ahmar Group<br>YEMEN   | <b>Cement Market Study</b><br><br>Domestic market study to support the financing of a new cement plant of 3,000 t/d clinker capacity in the southern part of Yemen   | 2004 |
| Libyan Cement Company<br>LIBYA  | <b>Due Diligence Survey for Privatization</b><br><br>Fact-finding mission and preparation of technical-economic due diligence survey report for the tendered privatization of<br>➤ Benghazi / Hawari cement factory (4 production lines) 5,400 t/d<br>➤ El-Fataiah cement factory, Dernah (2 production lines) 3,200 t/d   | 2004 |
| Arabian Cement Company<br>SAUDI ARABIA  | <b>Cement Plant Expansion</b><br><br>Preparation of Feasibility Study, Tender Documentation and Selection of General Turn-key Contractor for the Construction of an additional new cement kiln line no. 6 with a capacity of 7,000 tpd clinker, the closing down of four existing old long cement kiln lines and the incorporation of the kiln line no. 6 into the existing equipment with kiln line no. 5   | 2003 |

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|  |   |      |
|--|---|------|
| Southern Province Cement Company<br>SAUDI ARABIA | <b>Production Process Optimisation</b><br><br>Technical audit and evaluation of the existing cement plants at Bisha (one 5,400 tpd kiln line) and at Jazan (two 4,000 tpd kiln lines) with the purpose to study the production processes from the quarries to the cement dispatch, find bottlenecks and recommend the optimisation of the production process to increase the production capacities and to reduce the energy consumption | 2003 |
| F.K. Cement Co.<br>Fushe-Kruje<br>ALBANIA        | <b>Cement Plant Expansion</b><br><br>Preparation of a "project options feasibility study" for the expansion of a clinker grinding plant (remains of a former wet-process cement plant) to a complete dry-process cement plant equipped with precalciner kiln; comparison of capacity options between 1 to 1.3 million tpa with/without captive power plant and different fuel mixes (coal, lignite, petcoke)                            | 2003 |
| Arabian Cement Co.<br>Rabigh<br>SAUDI ARABIA     | <b>Cement Plant Upgrading</b><br><br>Feasibility studies for three options for the upgrading and expansion of the existing cement plant; the economic viability and feasibility of replacing the existing four long dry kilns (4 x 1,000 tpd clinker production) by a modern 5,000 tpd to 8,000 tpd preheater, precalciner kiln and additional grinding plants  | 2002 |
| Fa. Cementa Lukavac<br>Bosnia & Herzegovina      | <b>Cement Plant Optimisation</b><br><br>Monitoring consultancy for the optimisation and upgrading of a dry-process cement plant, incl. conversion from fuel oil to coal firing and use of coking gas, installation of 2nd cement mill / addition of pozzolanic flyash from thermal power plant at Tuzla   | 2002 |
| Tabuk Cement Co.<br>SAUDI ARABIA                 | <b>Cement Plant Expansion</b><br><br>Monitoring consultancy for the construction of the first plant expansion to the 1,100,000 tpa cement plant consisting of a fourth cement silo, a second cement transportation line, a third bulk loading plant, an upgrading of the existing kiln line and an expansion of the existing cement grinding sections   | 2002 |



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|   |   |                 |
|---|---|-----------------|
| Fa. Cementa Lukavac<br>BOSNIA & HERZEGO-<br>VINA                      | <b>Cement Plant Expansion</b><br><br>Preparation of a "project options feasibility study" for the optimisation, upgrading and expansion of the dry process cement plant at Lukavac near Tuzla, from 250,000 tpa to 800,000 tpa and conversion from fuel oil firing to mixed fuel with use of coal and secondary low cost fuels, i.e. <ul style="list-style-type: none"><li>➤ low grade coal</li><li>➤ lignite</li><li>➤ wasted rubber tyres</li><li>➤ wasted lube-oil</li></ul> | 2001            |
| National Cement Co.<br>EGYPT<br>Pannel Kerr Forster<br>UNITED KINGDOM | <b>Privatisation</b><br><br>Technical audit for the planned privatisation of the cement company operating at Tabbin / Helwan, Cairo and producing 3,000,000 tpa <ul style="list-style-type: none"><li>➤ ordinary Portland cement</li><li>➤ sulphate resistant Portland cement</li><li>➤ blast-furnace slag cement</li><li>➤ masonry cement</li><li>➤ gypsum plaster</li><li>➤ light-weight expanded clay aggregate</li></ul> including domestic market survey                   | 2001            |
| Tabuk Cement Co.<br>SAUDI ARABIA                                      | <b>Production Process Monitoring and Quality Control</b><br><br>Management of the quality control department of the Tabuk Cement Company's 1,100,000 tpa dry-process cement plant at Duba for the production of <ul style="list-style-type: none"><li>➤ ordinary Portland cement</li><li>➤ sulphate resistant Portland cement</li><li>➤ Portland pozzolan cement</li></ul> including training of personnel, laboratory services and pertinent operational assistance            | 2001            |
| Bestway Cement Ltd.<br>PAKISTAN<br>Unitherm Cemcom<br>AUSTRIA         | <b>Conversion of Kiln Firing System</b><br><br>Operational assistance and quality control consultancy during conversion of the firing system of a 3,300 t/d rotary kiln with off-line pre-calcliner from the use of heavy fuel oil to natural gas or the combination of both fuels  | 2000            |
| Adra Co.<br>SYRIA   | <b>Cement Plant Upgrading</b><br><br>Consultancy services including implementation engineering and supervision of work for upgrading of the third dry-process production line of 300,000 tpa ordinary Portland cement at Adra, Damascus   | 1999<br>to date |

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|  |   |      |
|--|---|------|
| Libyan Cement Co.<br>LIBYA                                       | <b>White Cement Plant</b><br><br>Feasibility study, basic engineering and preparation of tender documents for the construction of a 200,000 tpa white cement plant at the El-Fataiah chalk deposit near Derna   | 1998 |
| Al Ahmar Group<br>YEMEN  | <b>Cement Plant</b><br><br>Feasibility study for the construction of a 670,000 tpa cement plant for the production of ordinary Portland cement and sulphate resistant cement in the Abyan province in southern Yemen  | 1997 |
| Libyan Cement Co.<br>LIBYA                                       | <b>Cement Plant Expansion</b><br><br>Feasibility study, basic engineering and preparation of tender documents for the expansion of the El-Fataiah cement works by adding one production line with precalciner for 1,000,000 tpa ordinary Portland cement; the services include geological exploration of limestone and clay deposits, the cement plant project and a sea-terminal at Derna for the export of clinker and cement | 1996 |
| Foster Yeoman Ltd.<br>GREAT BRITAIN                              | <b>Quarry Optimization</b><br><br>Opportunity study for the recycling of waste material from a limestone quarry   | 1995 |
| Tabuk Cement Co.<br>SAUDI ARABIA                                 | <b>Cement Plant</b><br><br>Monitoring consultancy for the construction of a dry-process cement plant equipped with pre-calciner kiln producing 1,100,000 tpa ordinary & sulphate resistant Portland cement at Duba at the Red Sea. The project also includes power generation and seawater desalination   | 1994 |
| State Administration for<br>Building Materials Industry<br>CHINA | <b>Small-scale Cement Plants Modernisation</b><br><br>Sector study concerning technical improvements, environmental aspects, operational issues in assistance to the Chinese Government to formulate the policy and new regulations for the restructuring of the small-scale segment of the Chinese cement industry   | 1994 |
| KfW<br>GERMANY   | <b>Cement Plant Rehabilitation</b><br><br>Feasibility study for the rehabilitation of the Muger Cement Factory (600,000 tpa clinker design capacity) in Ethiopia  | 1993 |

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### Consultancy Services for the Cement Industry & Industrial Minerals

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|  |   |      |
|--|---|------|
| I.B.R.D.<br>Washington, D.C.<br>U.S.A.         | <b>Cement Companies Management</b><br><br>Preparation of tender documents and draft contract for management services to three cement companies in Egypt   | 1993 |
| Pragocement<br>CZECH REPUBLIC                  | <b>Cement Clinker Cooler</b><br><br>Technical study on the reduction of aerosol emissions from two grate-coolers of 2 x 250,000 tpa clinker output  | 1993 |
| Benue Cement Company<br>Benue State<br>NIGERIA | <b>Cement Plant Optimization</b><br><br>Engineering, reconstruction and commissioning of two cement grinding plants, pneumatic cement transport facilities and compressed air system  | 1992 |
| I.B.R.D.<br>Washington, D.C.<br>U.S.A.         | <b>Cement Industry Optimization</b><br><br>Evaluation of technical audits for three cement plants in Egypt with special emphasis on energy conservation and protection of environment   | 1992 |
| Tigrai Development Association<br>ETHIOPIA     | <b>Cement Plant</b><br><br>Feasibility study for the construction of a 300,000 tpa cement plant at Mekele in northern Ethiopia  | 1992 |
| Geological Survey of Austria<br>AUSTRIA        | <b>Carbonates Exploration</b><br><br>Geological survey of Lower Austria to evaluate its potential on high-grade carbonate rock for industrial use   | 1992 |
| SIMAC Holding<br>SLOVAKIA                      | <b>Mini Cement Plant Optimization</b><br><br>Opportunity study for the optimisation of a cement plant with 5 shaft kilns at Horné Srnie, Slovakia   | 1991 |
| Multiwall Papersacks<br>GHANA                  | <b>Cement Clinker Plant</b><br><br>Feasibility study for 500,000 tpa Portland cement clinker production from domestic raw materials for 2 existing cement grinding plants   | 1990 |
| Yakutcement<br>RUSSIAN FEDERATION              | <b>Cement Plant Expansion</b><br><br>Basic engineering based on pilot tests for a new production line at Mochsogolloch, Yakutia Sacha Republic, for 650,000 tpa Portland cement; process modification from wet to semi-wet and introduction of pre-calcining technology | 1990 |

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### Consultancy Services for the Cement Industry & Industrial Minerals

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|   |   |      |
|---|---|------|
| Development Bank of<br>the Philippines<br>PHILIPPINES | <b>Cement Industry Restructuring</b><br><br>Sub-sector fact finding mission concerning the restructuring of the cement industry of the Philippines financed by the World Bank   | 1990 |
| Ministry of Commerce<br>and Industry<br>BURUNDI       | <b>Mini Cement Plant</b><br><br>Feasibility study including the comparative evaluation of alternative proposals for cement manufacture on small-scale based on either domestic raw materials or imported cement clinker   | 1989 |
| United Nations<br>New York<br>U.S.A.                  | <b>Bauxite Sector Development</b><br><br>Regional techno-economic study of the integrated exploitation and processing of bauxite from deposits in Mozambique and in Malawi extending to Zimbabwe for the establishment of an alumina industry in the SADCC region | 1989 |
| United Nations<br>New York<br>U.S.A.                  | <b>Lime Sector Development</b><br><br>Regional market study to support the development of the lime industry in the SADCC member countries Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia, Zimbabwe                                    | 1989 |
| I.B.R.D.<br>Washington, D.C.<br>U.S.A.                | <b>Cement Industry Expansion</b><br><br>Sub-sector fact finding mission for the expansion of the cement industry in Egypt   | 1988 |
| Wolfsegg-Traunthaler<br>Collieries<br>AUSTRIA         | <b>Lignite Mining</b><br><br>Corporate management consultancy assignment at 500,000 tpa underground and open pit lignite mine   | 1988 |
| Société des Mines<br>RWANDA                           | <b>Small Scale Mining</b><br><br>Design and evaluation of technical and financial assistance programme for artisanal mining of cassiterite and colombo-tantalite  | 1988 |
| Provincial Government<br>Lower Austria<br>AUSTRIA     | <b>Gold Exploration</b><br><br>Mine property evaluation through geological survey and systematic geochemical sampling of old copper mine with reported gold values  | 1988 |

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|   |  |      |
|---|--|------|
| Benue Cement Co.<br>NIGERIA                     | <b>Cement Plant Optimization</b><br>Technical study for the modification and modernisation of 900,000 tpa dry-process cement plant for increase in production capacity and optimisation of operation   | 1988 |
| Rigips Austria<br>AUSTRIA                       | <b>Gypsum Mining</b><br>Medium and long-term mine planning for 120,000 tpa open pit/underground gypsum/anhydride operation   | 1988 |
| Bleiberg Bergwerks-<br>Union<br>AUSTRIA         | <b>Antimony Mining &amp; Processing</b><br>Techno-economic evaluation of strategic concept for re-structuring the Austrian antimony industry, including assessment of geological potential, mine viability and antimony additive production              | 1988 |
| Department of Trade<br>and Industries<br>BHUTAN | <b>Graphite &amp; Coal Mining</b><br>Feasibility study on graphite project and pre-feasibility study on coal project   | 1988 |
| MINEREX Mineral-<br>Exploration<br>AUSTRIA      | <b>Lithium Mining &amp; Processing</b><br>Appraisal of an underground lithium ore mining project, including conceptual design of underground mine, beneficiation plant, carbonate production plant, market potential and financial evaluation of project | 1987 |
| Ministry of Construction<br>LAOS                | <b>Mini Cement Plant</b><br>Feasibility study for a 60,000 tpa mini cement plant based on shaft kiln technology, including assessment of raw materials, geological investigation of anthracite coal deposit  | 1987 |
| Bleiberg Bergwerks-<br>Union<br>AUSTRIA         | <b>Lead &amp; Zinc Industry</b><br>Analysis of lead and zinc production costs of the leading international producers, including mining operations, processing plants and smelters  | 1987 |
| MINEREX Mineral-<br>Exploration<br>AUSTRIA      | <b>Feldspar-Silica-Mica Mining</b><br>Preliminary market survey for feldspar, silica sand and mica as by-product of planned lithium ore mining and processing  | 1987 |

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|   |  |      |
|---|--|------|
| Cement Company of<br>Northern Nigeria<br>NIGERIA  | <b>Cement Plant Operational Assistance</b><br><br>Long term agreement for the establishment of a technical documentation & data bank and continuous procurement of spare parts & consumables; financial engineering and technical assistance                                 | 1987 |
| Bleiberg Bergwerks-<br>Union<br>AUSTRIA           | <b>Antimony Mining</b><br><br>Determination of technical, legal and financial requirements in connection with the possible closure of a 25,000 tpa r.o.m. antimony mine  | 1987 |
| Bleiberg Bergwerks-<br>Union<br>AUSTRIA           | <b>Lead-Zinc Mining</b><br><br>Determination of technical, legal and financial requirements in connection with the possible closure of a 500,000 tpa r.o.m. lead-zinc mine   | 1987 |
| World Bank<br>Washington D.C.<br>U.S.A.           | <b>Industrial Minerals Research</b><br><br>Mineral economics research on the economic perspectives of industrial mineral extraction in developing countries as basis for the establishment of policy guidelines for future lending operations in this field                  | 1986 |
| Provincial Government<br>Lower Austria<br>AUSTRIA | <b>Mineral Projects Development</b><br><br>Techno-economic evaluation and assessment of mineral-oriented investigation results for identification of commercial production potential and recommendation for future development   | 1986 |
| Çitosan<br>TURKEY                                 | <b>Cement Industry Restructuring</b><br><br>Review of restructuring programme subject to World Bank financing including conversion to coal firing and increased use of additives   | 1986 |
| World Bank<br>Washington D.C.<br>U.S.A.           | <b>Small-Scale Mining Policy Research</b><br><br>World-wide policy research project regarding issues, development potential and assistance options for small-scale mining in developing countries as a basis for future World Bank lending operations to this target segment | 1986 |
| Provincial Government<br>Lower Austria<br>AUSTRIA | <b>Mineral Survey</b><br><br>Assessment of mineral resource potential of 4,100 km <sup>2</sup> target area in Lower Austria including geological prospecting, geochemical sampling, multi-element analysis and evaluation of minerals potential                              | 1986 |

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|---|--|------|
| Unong Mines<br>PHILIPPINES                              | <b>Coal Mining</b><br><br>Detailed review and recalculation of recoverable coal reserves and assessment of coal quality  | 1985 |
| Provincial Government<br>Lower Austria<br>AUSTRIA       | <b>Kaolin Mining</b><br><br>Prospecting for and exploration of kaolin occurrences including air-photo interpretation, geophysical survey and core drilling   | 1985 |
| Tibni Mine<br>SYRIA                                     | <b>Rock Salt Mining</b><br><br>Field mission and basic engineering for expansion of an underground rock salt mine  | 1985 |
| State Mining Corporation<br>TANZANIA                    | <b>Kaolin Filler Plant</b><br><br>Engineering services for the rehabilitation of small-scale kaolin mine and processing plant; procurement services for mining and processing equipment, assistance in operation of plant                                  | 1985 |
| Ministry of Commerce<br>and Industry<br>BURUNDI         | <b>Limestone Exploration</b><br><br>Geological assessment of the availability of limestone for a 60,000 tpa mini cement plant; investigation of travertine deposits, including chemo-physical raw material evaluation and calculation of mineable reserves | 1985 |
| World Bank<br>Washington D.C.<br>U.S.A.                 | <b>Limestone Exploration</b><br><br>Geological assessment of the suitability of limestone deposits for the production of calcium carbide in Bhutan   | 1984 |
| State Mining Corporation<br>TANZANIA                    | <b>Kaolin Processing</b><br><br>Appraisal report on the possibilities of the rehabilitation and expansion of an existing small-scale kaolin operation  | 1984 |
| Ministry of Petroleum<br>and Mineral Resources<br>SYRIA | <b>Dolomite Refractory Plant</b><br><br>Feasibility study for mining of dolomite and manufacture of refractory bricks for use in the steel and cement industry   | 1984 |
| Ministry of Industry<br>DJIBOUTI                        | <b>Mini Cement Plant</b><br><br>Feasibility study for a 60,000 tpa mini cement plant based on shaft kiln technology, including geological investigations   | 1983 |

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|   |  |      |
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| G. F. Appio<br>NIGERIA                    | <b>Lime Plant</b><br>Feasibility study for a 25,000 tpa lime plant in Cross River State  | 1983 |
| Ooni of Ife<br>NIGERIA                    | <b>Granite Quarry</b><br>Feasibility study for opening a granite quarry and establishment of a crushing and screening plant and a dimension stone cutting plant in Ondo State  | 1983 |
| Ministry of Natural Resources<br>RWANDA   | <b>Tin Mining</b><br>Expert opinion on the development potential of the artisanal small-scale tin mining sector  | 1983 |
| African Development Bank<br>COTE D'IVOIRE | <b>Cement Plant</b><br>Fact-finding mission and appraisal of a cement project in Mali  | 1982 |
| Jagadamba Cements<br>INDIA                | <b>Mini Cement Plant</b><br>Basic design of a mini cement plant based on dry process technology with short rotary kiln and central grinding unit   | 1982 |
| The Arab Potash Company<br>JORDAN         | <b>Soda Ash Plant</b><br>Feasibility study for a soda ash project with a capacity of 150,000 tpa, based on sodium chloride recovered from the Dead Sea, including market survey for soda-ash and industrial salt, geological investigations of a high-grade limestone deposit in the Jordan valley | 1981 |
| Guyana Mining Enterprise<br>GUYANA        | <b>Bauxite Mining</b><br>Technical study for Bauxite crude ore handling and a homogenisation plant   | 1981 |
| Empresa Minera Cumaratza<br>ECUADOR       | <b>Gold Exploration</b><br>Assessment of gold placer deposits and evaluation of small and medium-scale mining potential  | 1980 |
| Ministry of Industry<br>PHILIPPINES       | <b>Mining of Coal &amp; Iron Ore</b><br>Investigations and assessment of indigenous raw material resources as main supply for a steel mill, including the evaluation of development potential of small-scale coal mining districts   | 1980 |



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| Empresa Minera<br>Cumbaratza<br>ECUADOR            | <b>Base Metals Ore Exploration</b><br><br>Non-ferrous metals exploration by core drilling for lead, zinc and copper   | 1980 |
| Cementos Guastatoya<br>GUATEMALA                   | <b>Cement Plant</b><br><br>Feasibility study for a 500,000 tpa cement plant based on dry process technology with short rotary kiln  | 1980 |
| State Mining Corpora-<br>tion<br>TANZANIA          | <b>Kaolin Mining &amp; Processing</b><br><br>Feasibility study for the expansion of a Kaolin mine and processing plant; increase from 10,000 tpa to 110,000 tpa crude kaolin, including geological investigations             | 1979 |
| Ondo State Government<br>NIGERIA                   | <b>Limestone Exploration</b><br><br>Assessment of a limestone deposit for cement and lime production  | 1978 |
| Nigerian Mining<br>Corporation<br>NIGERIA          | <b>Lime Plant</b><br><br>Feasibility study for the establishment of lime plants in Sokoto State and in Cross River State  | 1978 |
| Haiti & Caribbean<br>Cement Import Export<br>HAITI | <b>Cement Plant</b><br><br>Feasibility study for a cement plant to produce 600,000 tpa Portland cement by semi-dry or dry process respectively including geological investigations and core drilling at alternative locations | 1978 |
| Cement Company of<br>Northern Nigeria<br>NIGERIA   | <b>Cement Plant Expansion</b><br><br>Monitoring consultancy for resuscitation and expansion of a cement plant from 100,000 tpa to 600,000 tpa Portland cement by dry process technology with short rotary kiln                | 1978 |
| Société des Mines<br>RWANDA                        | <b>Tungsten Processing</b><br><br>Opportunity study of the possibility to increase the tungsten content in concentrates from an existing ore treatment plant, including the supply of the pilot classification plant          | 1977 |
| IVA-Engineering &<br>Contracting<br>IRAN           | <b>Cement Plant</b><br><br>Detail engineering for the second cement production line for a capacity of 700,000 tpa by dry process with short rotary kiln at Loshan   | 1977 |

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| Procarbón de Occidente<br>COLOMBIA                      | <b>Coal Mining</b><br>Feasibility study for the development of the Cauca Valley coal district by planned capacity increase from 0.6 million tpa to 1.2 million tpa; development programme for small-scale underground lignite mines                        | 1977 |
| Industrial Development Corporation<br>TRINIDAD & TOBAGO | <b>Cement Industry Restructuring</b><br>Assets valuation of cement company producing 270,000 tpa of various cements by wet process   | 1976 |
| Corporación Nacional de Inversiones<br>HONDURAS         | <b>Cement Plant</b><br>Feasibility study for a cement plant with a capacity of 360,000 tpa of Portland and pozzolanic cement by dry process with short rotary kiln, including geological investigation and core drilling                                   | 1975 |
| Government of Abu Dhabi<br>UNITED ARAB EMIRATES         | <b>Cement Raw Mix Composition</b><br>Technical study for the use of ferruginous bauxite and silica sand as additives to the cement raw mix and assistance in procurement of imports from Pakistan  | 1974 |
| Rudar Konjic<br>YUGOSLAVIA                              | <b>Filler Plant Expansion</b><br>Basic engineering based on laboratory investigations for the expansion of a pyrophyllite dressing plant for paper filler production through the addition of a wet classification and micronizing units                    | 1974 |
| Calabar Cement Co.<br>NIGERIA                           | <b>Cement Terminal</b><br>Monitoring consultancy for the construction of a cement terminal with ship unloading facilities for 50,000 tpa bulk cement; located at Oron, Calabar river, Akwa Ibom State  | 1973 |
| Union Cement Co.<br>UNITED ARAB EMIRATES                | <b>Cement Plant</b><br>Supervision of erection, start-up and commissioning of the Khor Khoweir cement plant in the Emirate Ras Al-Khaimah, producing 250,000 tpa of Portland cement by dry process with long rotary kiln, including operational assistance | 1973 |

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| Calabar Cement Co.<br>NIGERIA                           | <b>Cement Raw Materials</b><br><br>Technical study for the exploitation of limestone and clay by expansion of the existing quarry, and rationalisation to increase the output up to 650,000 tpa   | 1973 |
| Calabar Cement Co.<br>NIGERIA                           | <b>Cement Plant Expansion</b><br><br>Monitoring consultancy for the conversion of a cement factory from wet process to dry process with short rotary kilns; expansion from 100,000 tpa to 400,000 tpa Portland cement, including assistance in operation of plant | 1972 |
| Calabar Cement Co.<br>NIGERIA                           | <b>Cement Raw Materials Exploration</b><br><br>Exploration and mine planning for limestone, clay, shale and lateritic iron ore deposits including core drilling   | 1972 |
| Technical Agency,<br>Government of Ethiopia<br>ETHIOPIA | <b>Cement Industry Expansion</b><br><br>Feasibility study for the expansion of the national cement industry up to a production capacity of 300,000 tpa Portland cement  | 1970 |



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