OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

"THINKING GLOBALLY ACTING LOCALLY"

PROCEEDINGS OF THE

WORKSHOP ON CONSULTING SERVICES

IN ENERGY CONSERVATION

Zagreb, 13 - 17 May 1991

UNDP/UNIDO Project DP/RER/83/003

"Industrial Energy Conservation"

PROCEEDINGS OF THE

WORKSHOP ON CONSULTING SERVICES IN ENERGY CONSERVATION

Edited by: R. Šenjug

Zagreb, Yugoslavia

May 13-17, 1991

THE WORKSHOP

ON

CONSULTING SERVICES IN ENERGY CONSERVATION

was organized by

the United Nations Industrial Development Organization
(UNIDO)

in co-operation with ENCONET International,ltd. Zagreb, Yugoslavia

under UNDP/UNIDO Project DP/RER/83/003

"Industrial Energy Conservation"

Table of Contents

PREFACE

This Workshop was organized by the United Nations Industrial Development Organization (UNIDO) in co-operation with ENCONET International,ltd. Zagreb, Yugoslavia. The Workshop was held at the ENCONET International,ltd. (Unska 3, Zagreb, Yugoslavia), from 13 - 17 May 1991.

The Workshop was a part of the project UNDP/UNIDO DP/RER/83/003 "Industrial Energy Conservation". From the beginning of the project, there was an intention to continue the cooperation in the form of the created Network after the termination of financial support from UNDP sources.

The question of a selfsustained operation has been raised on several former PTC and later NSC meetings in Vienna. On the 1988 NSC meeting, it was agreed that a kind of selfsustain operation can be achieved only on commercial ground. It was concluded to prepare a bankability and profitability study, which should examine possible organisational, functional and legal aspects of such an operation.

This was done by dr.L.Lengley in the "Network development study", which summarized the services which can be offered by the company conditionally named "ENCONET UNION", possible legal and financial framework.

The Workshop on Training in Management of Commercial Organizations held last year in Budapest, Hungary, gave to the representatives of the project countries the necessary information about the management, and the possible organisational forms of the supposed self-sustained organization.

In the meantime some concrete steps were made in establishing such organization. However, experience has shown that we are facing growing competitive and regulatory pressure in offering, conducting and delivering the consulting services. So, marketing arised as an essential function for a selfsustain operation of such organization.

The marketing effort should be directed in such a way to assure potential customers in all benefits and a high quality of the offered services. That is why it was decided to organize this Workshop in Yugoslavia on the marketing with special respect to the network services, and quality assurance in offering, conducting and delivering such services.

INTRODUCTION

This Workshop is designed for energy specialists in developing countries who are oriented towards the field of energy conservation, and who intend to offer consultant services as individuals or within a consulting company. The aim of this Workshopp is to provide a framework for starting up and performing this kind of business.

Objectives of the Workshop were the following:

(i) To inform about the standards, regulations and requirements in offering, conducting and delivering the consulting services.

(ii) To become familiar with the types of organizations and working procedures for consulting services.

(iii)To achieve better understanding, communicating and implementing of subject matter by means of training on case-studies.

The workshop comprised formal tuition sessions, workshops in syndicate and open forum discussions. The visual aids were used during tutorial sessions. The workshops in syndicate were supported with modern technical equipment (video-recording and reproduction, computer).

The working language of the Workshop was English and all the materials presented and produced were typed in English.

Proceedings of the
THE WORKSHOP ON CONSULTING SERVICES IN ENERGY CONSERVATION
Zagreb, Yugoslavia, May 13 - 17, 1991

DEVELOPING COUNTRIES & ENERGY CONSERVATION

[illegible]

Proceedings of the
THE WORKSHOP ON CONSULTING SERVICES IN ENERGY CONSERVATION
Zagreb, Yugoslavia, May 13 - 17, 1991

DEVELOPING COUNTRIES & ENERGY CONSERVATION

L. Lengyel, National Authority for Energy Economy,

IMP-OEGH, Budapest, Hungary

1.1 Towards Market Oriented Energy Policies

The market investigations carried out in the developing countries indicate a significant market for energy conservation services provided by an independent consulting company.

A lot of developing countries are now opting for a replacement of central energy planning by market-oriented energy policies and practices. A typical policy of market adaptation emerged consisting of a change of

- policies (the pivotal role is assigned to energy efficiency),

- institutions (policy and operational functions are separated; energy ministries are dissolved; fuel boards, conservation agencies and independent energy enterprises are set up),

- instruments (prices are increased, subsidies reduced, markets created, foreign trade monopolies abolished),

- relations (between governments and citizens, utilities and customers, employees and employers, national and foreign investors).

Differences in the conditions prevailing in various countries resulted in the emergence of specific national "models" of market adaptation. Differences relate to

- the speed of reforms;

- the respective roles of governments and markets;

- the relative strength of supply and demand policies;

- intra-fuel competition (e.g. coal to coal competition);

- deregulation of network monopolies;

- public awareness and acceptance.

Changing Policy Priorities

There was first a change of energy policy priorities. Whereas in the past overriding priorities were the expansion of supplies based to the maximum possible on indigenous energy sources, the maintaining of low energy prices and of the earning of hard currency from energy exports, the new priorities highlighted.

-the rational use of energy, primarily through cost-effective energy pricing;

-trade diversification as a means of securing energy supplies;

-profitability as a yardstick for reducing or developing domestic energy resources;

- environmental protection and citizen participation;

- integration into wider international energy markets.

The energy reforms in central and eastern Europe are of relevance to third countries, particularly in Europe in that they

- aim at significantly increasing energy efficiency;

-intend to introduce or raise environmental protection standards;

-change the structure of energy supplies towards less CO_2-prone sources;

- improve nuclear safety;

-imply a decline of the net export position of this group of countries;

-open business opportunities in the fields of interconnections, retro-fitting, energy efficient equipment and appliances;

- require aid programmes.

1.2 Why energy conservation ?

Energy conservation has attractive business opportunities. Energy conservation is a cheap, quick and relatively painless way for most developing countries to stretch energy supplies, slash energy costs, and save foreign exchange. The industrial and power sectors offer the largest and most easily captured energy conservation potential. Technically proven, cost-effective energy conservation techniques and processes can save developing countries an estimated 10 to 30 percent of industrial sector energy consumption and 10 to 25 percent of power sector energy consumption.

Based on these facts, in recent years a number of developing countries have initiated programs to promote energy conservation. However, the general conclusion at the international donor community and many developing countries themselves has been that despite these energy conservation efforts, only a fraction of the tremendous energy conservation potential has been captured, especially for projects that require significant investments. This resistance is thought to be the result of numerous technical, economic, financial, institutional and policy barriers which affect the ability and willingness of energy users to make energy conservation investments.

Developing countries need the energy conservation technical and financial assistance, training and information services in form of direct, country-specific assistance, and non-country-specific analysis on major energy conservation issues and problems, such as energy pricing, innovative financing, private power, load management, training need and barriers to energy conservation investment.

1.3 Energy Conservation and Environment

Till recently, environmental problems were not identified in developing countries, although very serious problems have been already present.

The links between economic policy and the environment, although not yet fully understood, are becoming better recognized. Inappropriate economic policy ia an important determinants of environmental degradation.

Energy conservation issues are going to gain new inertia by environmental concerns. Today, the very conditions of life on our planet are seriously threatened. Non-sustainable use of energy is at the roots of numerous environmental problems, notably the destruction of the resource base for future generations, the build up of greenhouse gases and adverse impact on biological systems. Whereas governments so far are concerned primarily with local and regional environmental problems, they are now becoming increasingly aware of and concerned by the global effects of anthropologically-induced climate change.

The scope of the problems requires collaborative action by national governments and international and non-governmental organizations. Within the concept of sustainability, common objectives and concrete measured must be defined. In the development of international agreements, consideration should be given to new approaches for financing international actions, including an International Environmental Fund for Sustainable Development. The ECE will have an important role to play in better integrating environment and energy policies. ECE might, in particular, wish to undertake - in cooperation with other organizations - a project aiming at reducing the efficiency gap between ECE countries, particularly between East and West and at enhancing trade and cooperation in energy efficient, environmentally sound techniques and management practices.

Further on the OECD, the IEA, the ECMT and other affiliated organizations, following the commitments of their Ministers in 1989 are encouraged to entrance program in the fields of energy conservation as the most effective tool of the sustainable energy use. The World Commission on Environment and Development have recognized that the following tasks are common challenges to all countries:

- saving energy and improving energy efficiency,

- reducing energy sector emissions by avoiding or modifying energy-consuming production processes and industrial systems.

1.4 Business opportunities

The market investigations carried out in the developing countries indicate a significant market for energy conservation services provided by an independent consulting company.

In the developing countries the industrial and power sectors offer the largest and most easily captured energy conservation potential. Energy conservation is a cheep, quick and relatively easy way for most developing countries to stretch energy supply, reduce energy costs and save foreign exchange. Thus energy conservation could be conceived as replacement of supply so it must compete with the supply side enhancement.

The volume and variety of business opportunities opened by the energy reforms in central and eastern Europe are unprecedented, and, hence of particular significance to third countries. However, financing and practical difficulties will severely restrict these prospects, unless vigorously addressed.

The modernization of the energy supply, transmission and use systems and the introduction of acceptable environmental standards just in central and eastern Europe could require capital of the order of $US1,200 billion (10) for the next two or three decades. This estimate can be implied from estimates of investment needs for selected segments of these energy systems for particular countries.

The reforms of the energy systems in developing countries require aid programmes:

-to assist in the introduction of market economy structures and policies;

-to overcome short term supply shortages and financing gaps;

-to enhance the transfer of technology, capital and management know how.

Assistance in institution building, legislative reforms and policy planning become very intensive. Both bilaterally and multilaterally (ECE, UNDP, UNIDO, World Bank, IAEA, EEC), advisory services have been rendered and can be generally qualified as effective in this first phase of reforms. To quote two particularly successful ECE initiatives: upon invitation of the Czechoslovakian and French Governments, a Consultation on the "Market Adaptation of Coal Industries in Central and Eastern Europe" was held in these countries in June 1990, at which officials and experts from formerly centrally planned economies and from market economies discussed the adaptation of the coal industries in central and eastern Europe to market conditions. Upon invitation of the Romanian Government, a "Briefing and Consultation on the Romanian Electric Power Situation, Prospects and Investment Needs" was held in Romania in November 1990, allowing an exchange of views on issues relating to the reform of the electric power sector, and to international co-operation.

Thus, international co-operation has covered first important stages:

- identification of the substantive issues;

- quantification of demands for assistance in terms of energy and finance;

- mobilization of a vast consensus to respond to these demands;

- establishment of machinery for contacts, co-ordination and evaluation;

- practical ad hoc help to cope with emergencies;

- assistance by means of project and standby credits;

- identification of the road to long-term comprehensive co-operation and common policies.

International institutions and collective decisions of Governments had launched a lot of initiatives such as:

- to support market penetration of energy efficient conversion and end use technologies trough financial assistance and the removal of institutional and other market barriers;

- to create opportunities for environmental - favourable energy-efficiency services and co-generation to compete fairly with traditional power production;

- to develop and employ a systems analysis approach to energy and environmental policy making including least cost energy planning which identifies the cheapest means of providing energy services to consumers;

- to help developing countries in an effort to correct existing environmental damage and to encourage them to take environmentally desirable actions, through economic incentives, including the use of aid mechanisms and transfer of technology. In special cases, debt forgiveness and debt-for-nature-swaps can play an useful role in environmental protection;

- to take into account all health effects, including cumulative and collective doses, from all stages of fuel cycles for all energy options - including conservation ones - considered;

- to intensify bilateral, multilateral and international cooperation to limit harmful emissions and to support the work of international bodies on this issue.

All of these initiatives provide potential market for an independent consulting company.

Proceedings of the
THE WORKSHOP ON CONSULTING SERVICES IN ENERGY CONSERVATION
Zagreb, Yugoslavia, May 13 - 17, 1991

CONSULTING SERVICES

R. Senjug, ENCONET International,
Zagreb, Croatia

Proceedings of the
THE WORKSHOP ON CONSULTING SERVICES IN ENERGY CONSERVATION
Zagreb, Yugoslavia, May 13 - 17, 1991

CONSULTING SERVICES

R. Senjug, ENCONET International,
Zagreb, Croatia

2.1 Types of Consulting Services

During each stage of the project, investigations have to be made, studies prepared and planning and supervision work carried out. These activities may be performed in part by the owner. However, it often becomes necessary for the owner to employ consultants to facilitate the implementation of the project.

Industrial consultants provide different types and forms of services, which may be classified as follows:

- *Design and engineering services*

Design and engineering services are the "classical" consulting services for the establishment of an industrial plant and may include opportunity and feasibility studies, plant design, preparation of tender documents for equipment and civil engineering, evaluation of bids, supervision of erection and start-up as well as assistance in the initial operation.

- *Technological services*

Technological services are concerned with the exploration and examination of natural resources and raw material, evaluation and improvement of production methods, establishment of industrial plant regulations and codes, including construction standards and safety facilities.

- *Economic services*

Economic services of consultants may cover surveys of specific industries, formulation of investment opportunities, project analyses and identification of sources of financing.

- Management services

Management services include the review and evaluation of the objectives and goals of a particular project, management surveys, production planning and control schemes at the plant level, management and personnel planning and electronic data processing.

- *Training programmes*

Consultants frequently train the local labour force so that the latter may take over and operate the plant when the consultants' assignments are completed. The consultants may set up and administer the local training centers and in-plant training programmes and technicians and give advice on a long-term training plan.

- Co-ordination services

Co-ordination services include bringing together the various functions involved in a project-financial, managerial, marketing and technical functions.

2.2 Scope of Consulting Services

Depending on the project achievement approach applied the scope of the consultant's work is changed. There is a number of project achievement approaches available to the project owner. On the following pages they will be described in their most elementary form to provide for clearness and contrast. So, the four main different methods will be considered:

- conventional;
- in-house;
- project management;
- turnkey.

Of course, many variations and transitions on and between these methods are in existence, each with their own merits. It is also recognized that a distinction can be made between application of methods for different ranges of projects. But, for the sake of clearness and simplicity, such distinction is not being made.

The consulting company should not have any financial interest in construction or manufacturing or supply of materials and equipment for the project under consideration and thus would be free from any possible conflicts of interest arising therefrom.

2.2.1 Pre-investment Analysis

Project achievement follows the first step by the owner which is to carry out adequate pre-investment study to determine project feasibility. In pre-investment analysis a consulting company or consultant may assist the owner to decide on project feasibility. For such purpose

a consulting company or consultant is selected on the basis of qualifications to handle the analysis required.

Fees are usually determined on an hourly fee plus re-imbursement of expenses or similar agreement, although lump sum contracts can be negotiated if the scope of the service is adequately defined. Fees should not be contingent upon project feasibility, because this puts the consultant in a position where his interests may conflict with those of the owner.

The decision to proceed with the project is the owner's and the consequences of this decision are substantial. On decision to proceed with a project, the owner must then select the method to be used for project achievement.

2.2.2 Conventional Form of Project Achievement

The conventional form of project achievement exists where an owner retains a consulting company to prepare plans and specifications for a project, to represent the owner's interests in taking bids or in negotiating and selecting contractors to carry out the project and to inspect and supervise project performance, acting as the owner's representative.

This method is proven to be the most satisfactory for the moderate and large size projects, and is generally the method encouraged by legal and financing agencies.

2.2.3 In-house Project Achievement

In-house project achievement involves substantial or total use of in-house staff to handle project achievement. Members of the owner's organization handle project management, conception, design.

In-house project achievement usually involves minimal use of the independent consulting company. The role of an independent consulting company is limited to consultation or assistance on specific aspects of the project on which the owner's in-house staff do not have sufficient capability, experience, or capacity.

The professional services are usually provided by firms or individuals selected on the basis of qualifications. Compensation is most commonly on an hourly fee plus re-imbursment of expenses or similar arrangement, although lump sum contracts can be negotiated if the scope of the services is adequately defined.

2.2.4 Project-Management Method of Project Achievement

"Project Management method of project achievement involves the owner in a single contract with a firm to handle project planning, project management, design services, procurement, construction management, commissioning and perhaps other aspects such as feasibility analysis, and assistance in arranging finance. Project Management involves greatly increased management effort and uses multiple contracts for other parties. The project management firm prepares and negotiates contracts with all entities involved in the actual project performance and manages the project implementation effort. In these activities, the project management

firm acts as the owner's agent. It does not function as contractor as it is the case with "Turnkey".

The consulting company may be the firm which leads the project or part of the consortium which achieves the project.

The services involved in Project Management are professional services and selection of the firm to provide them is on the basis of their qualifications.

Compensation is most commonly on the basis of reimbursement of costs plus fee, or as an alternative, an hourly fee or similar arrangement for those portions of the services which cannot be defined precisely at the outset and possibly a lump sum for a portion of the services. In addition, costs are normally reimbursable.

The Project Management approach is best suited to projects which are complex and require a tight schedule.

2.2.5 Turnkey Method of Project Achievement

The Turnkey method of project achievement involves a contract with a single company for the complete project ready for operation with some responsibility for subsequent efficient operation. In some instances, this arrangement may include provisions for financing the project.The owner or ultimate client retains the responsibility for maintenance and operation of the facility.

In Turnkey project achievement there are two separate roles which may be filled by the consulting company. One is in a consulting role as adviser to owner assisting him in meeting his requirements and endeavouring to protect the owner's interests on the project. The alternative role is as sub-contractor to the company contracting to perform the project, and acting as adviser to that company or as a part of a contracting consortium.

Consulting services to assist the owner are normally provided by firms or individuals selected on the basis of qualifications with compensation on an hourly fee plus re-imbursement of expenses or similar arrangement based on percentage of whole project cost although lump sum fees can be negotiated if the scope of the services can be adequately defined.

The firms providing professional design services as a sub-contract to the Turnkey company or consortium are normally selected on the basis of qualifications. Fee structures vary and may include lump sum fee, hourly fee or similar arrangement or a percentage of the whole project cost.

The Turnkey method of project achievement is best suited to projects which are:

1. Small or simple projects where scope definition problems are minimal and scope is standardized.

2. Projects where the need for a cost ceiling outweighs all other factors and the owner is satisfied with the limited degree of project definition that will exist at the time the cost ceiling is established.

3. Projects where specialized process expertise is held by a few organizations.

Turnkey companies can also handle extremely large and complex projects. However, careful examination of the contractual relationships involved usually reveals that the actual approach resembles the Project Management approach rather than turnkey approach.

2.3 Contracting

Many of the problems connected with the implementation of projects in developing countries can be traced to the contractual arrangements made for these projects. Three United Nations publications give guidance to managers, administrators and engineers in developing countries on specific issues arising in contracting:

- The *Manual on the Use of Consultants in Developing Countries* deals with various aspects of contracts with consultants.
- The *Manual on the Establishment of industrial Joint-Venture Agreements in Developing Countries* discusses the negotiation of joint-venture agreements and presents sample clauses that are usually included in such agreements.
- Contract Planning and Organization deals with the organizational aspects of contracting.

The following remarks are based primarily on common law concepts. Civil law principles in the field of contracts are generally similar but not necessarily identical in every case.

A contract is an agreement (expressed or implied) enforceable by law between two or more competent parties to do or not to do a particular thing. For a contract to be valid, a few preconditions must be satisfied. Of these, the most important are:

- Two or more competent parties;
- Legal subject matter,
- Consideration,
- Consent of the parties.

When one of these preconditions is missing, no valid contract is created. Although contracts can arise through words or actions, the ones considered here will and should be reduced to writing. The basic contents of a contract are briefly described below.

A written contract usually begins with a statement of the date, the names of the parties and their place of residence. In many written contracts the parties are referred to as "party of the first part", "party of the second part" according to the order in which their names first appear. It is, however, immaterial which of the parties' names is written first.

A statement of consideration is the next thing that often appears in a contract. Consideration is the substantial cause or reason inducing the parties to enter into an agreement. The statement of the consideration is usually followed by a fully statement of all that the first party agrees to do and all that the second party agrees to do, including events excusing performance, e.g. "force majeure".

Then there may be provisions concerning the consequences of default and the remedies, penalties or forfeitures in case either party does not faithfully and fully perform its part of agreement. Often these provisions will be followed by others dealing with settlement of disputes, e.g. arbitration or exclusive jurisdiction of the courts of a particular country or with the law governing the contract according to which it and the rights and obligations of the parties thereunder will be interpreted in case of dispute.

The contract may also call for some security to ensure performance, e.g. performance bonds or bank guarantees, retention money, letters of credit.

The contract ends with the signatures of the parties (whose authority to make the commitments in the contract should be checked).

Some basic legal concepts should be noted at this point.

- Errors in grammar or spelling do not affect the legality of the agreement;
- If the language is obscure on certain points, the arbitrator or court will try to determine the intent of the parties when they entered into the agreement. It is therefore of the utmost importance that the terms of the contract are specifically and explicitly stated, and every effort should be made to avoid ambiguity and uncertainty. In the event of ambiguity, the contract will normally be interpreted against the party drafting it;
- When an agreement is written, it must be complete in its written form. It should not and often cannot be partly oral. The agreement may, however, be contained in more than one written document, e.g. in specifications and drawings attached to the agreement or in general and particular sets of conditions, all or some of which may be bidding documents. Where the contracts comprises various documents, every effort to avoid inconsistencies between them should be made; if contradictions between the documents still remain, the order in which the contradictory clauses will prevail should be stipulated;
- An intentional alteration of a contract in a material part, by one party without the consent of the other, after its execution generally constitutes a breach that will discharge the other party from its obligations under the contract;
- An offer or proposal that includes the essential parts of a contract becomes a contract as soon as it is accepted. If not expressly otherwise stated, the acceptance must be as the offer is received. The offer may be withdrawn at any time before it has been accepted; but where contracts are awarded on the basis of invitations to bid, it is frequently customary for the owner to require a bid bond, or similar guarantee, to prevent withdrawal of the offer during the bidding period;
- A contract binding in the place where it is made is normally binding everywhere, but courts of one country will not enforce contracts made in another country if this would violate the statutes or public policy of their own country;
- A contract must be binding on both parties. This element of mutual obligation or consent is the very essence of a contract.

The planning and implementation of industrial projects involves the over in contracts with consultants, suppliers of equipment and civil work contractors. With regard to these parties at least three combinations of contracts are possible:

A) Separate contracts (e.g. between owner and consultant, owner and suppliers, owner and civil works contractor);

B) Joint contracts, where the consultants are linked with the equipment supplier or the civil works contractor (e.g. between owner and consultant, supplier; owner and consultant, civil works contractor);

C) Comprehensive, or turn-key contracts where all the elements are tied together in one contract (e.g. between owner and consultant, supplier, civil works contractor).

Each of these combinations has its own merits and drawbacks.

2.3.1 Types of Consulting Contracts

Man-Month (or Time-Based) Contracts

This type of contract is widely used for general planning and feasibility studies, for design, detailed engineering and supervision of construction, and for technical assistance assignments. The Bank uses this type of contract for most assignments performed directly for the Bank and, where appropriate, encourages its use by borrowers. Payments are based on agreed time-based rates and subsistence allowances for staff (who are normally named in the contract) and on reimbursable items. The time-based rate, which is usually the man month, includes salary, social costs, firm's overhead, fee or profit and, usually, an overseas allowance. The contract price normally includes a contingency allowance to cover unforeseen work and price adjustments within an overall price ceiling.

Lump-Sum Contracts

Lump-sum contracts are mainly used on detailed engineering assignments, usually in the industrial sector. Contracts with payments based on an agreed lump sum differ from man month or cost-plus-fixed-fee contracts in that, once the lump sum is agreed, no matching of inputs to payments is required. Payments are normally made against some agreed time or progress schedule. Lump-sum contracts are normally negotiated on the basis of either estimated inputs of personnel and other items or on percentages which are customary norms for that particular type of work. The lump sum is then normally fixed for the life of the contract.

Percentage Contracts

Percentage contracts directly relate the cost of consulting services to project construction costs, and are similar to lump-sum contracts in that, once the percentage is agreed, no matching of inputs to payments is required. The contracts are negotiated on the basis of norms for the work and/or professional fee scales. This type of contract is common for architectural assignments and is also promoted by some professional engineering associations for engineering design.

The Bank discourages consulting contracts based on a percentage of the actual construction cost, as they are, in effect, open-ended and may discourage innovative, cost-reducing design. The more acceptable basis is for the contract amount (or a major part of it) to be based on a

percentage of estimated rather than actual cost, and for the contract to be treated as a lump-sum contract.

Cost-Plus-Fixed-Fee Contracts

Cost-plus-fixed-fee contracts are usually associated with preparation and commissioning work for industrial and process engineering projects. The costs are the costs of personnel and materials expected to be required by the engineering contractor to manage the work, and there is a fixed time schedule to complete the work. The fee is the amount negotiated between the firm and the borrower on the basis of technological knowledge and level of management inputs. The contract is similar to a man-month contract, except that the fee element is separated out and paid according to a schedule-or against progress targets. However, unlike the man-month contract, if the consultant and the client agree that additional personnel time is required to complete within the fixed time period, the consultant is normally due only the additional costs without any additional fee or profit.

2.3.2 Sample Forms & General Rules

Many Sample Forms of a Contract for Consultants' Services and General Rules have been prepared by national and international professional and other organisations and agencies in order to facilitate contracting and to avoid problems that could arise.

Working with International Funding Agencies a consulting company is strongly recommended to use their Sample Form of a Contract for Consultants' Services and General Rules. In other situations a consulting company may chose either

- to use one of these well known Sample Form and General Rules, or
- to adapt some of existing Sample Forms and General Rules to own needs, or
- to design each time a new agreement.

For example, FIDIC, as an international association of consulting engineers, has published the White Book, which is intended to replace three documents known as IGRA 1979 D&S, IGRA 1979 PI and IGRA 1980 PM. The White Book has been prepared so that it can be incorporated in its entirety in international consultancy agreements as the General Rules. The General Rules rely on being supplemented by Particular Conditions, and several Appendixes. The draft of this document has been the subject of considerable discussion within FIDIC and consultation with the World Bank, Asian Development Bank and Arab Funds.

The provisions which require most attention are those of liability, indemnity and insurance. The White book defines the scope of liability of the parties to the consultancy agreement and provides the mechanism for determining the extent of the Consultant's liability in a reasonable, equitable and realistic manner. The White Book also addresses the need for Clients to indemnify Consultants against claims for loss or damage which do not fall within the scope and extent of the Consultant's liability. There is an emphasis of the idea of the parties to a Consultancy Agreement properly understanding and managing the risks assigned to them in the Agreement by obtaining appropriate insurance.

The earlier drafts of the White book also contained provisions intended to avoid the risk of divided responsibility when different Consultants are employed for different phases of a project. These have proved too contentious and have been omitted from the final document.

The World Bank has prepared the Sample Form of a Contract for Consultants' Services and General Rules for use by borrowers hiring consultants for complex assignments like e.g. design, engineering and supervision services, management services, etc. In drafting the Sample Form, Bank's staff have tried to fairly represent the interests of both clients and consultants. While not mandatory, the use of this Sample Form for major consulting assignments is strongly recommended to World Bank borrowers.

The Bank also expects to prepare in due timea Sample Form for less complex assignments, like e.g., various types of studies. In the meantime, borrowers hiring consultants for less complex assignments may adapt for this purpose either this Sample form or the Standard form of a Contract for Consultants' Services used by the World Bank when hiring consultants as an executing agency for UNDP.

2.4 Selection procedure

First of all it should be pointed out that the price is not the only award criterion when we are speaking about the selection of the consulting service provider. Selection is usually made by reference to:

- ability,
- efficiency,
- reliability, and
- experience.

It is self-evident that in consulting business one would not choose the cheapest bid but rather go for value for money. Any aspect covered by that concept is perfectly legitimate under the rules.

Practice suggests that there is no universally-accepted procedure for selection of consultants. First, the choice of consultant may be informal: the client contacts a consultant already known, or who has been made known to him, and entrusts the work to that consultant.

There are, however, more extensive and formal procedures for the selection of consulting engineers. Before the actual selection takes place, it is assumed that the client has defined the project, has established a procedure for selection, and has authorized a person or persons (selection board) to select or recommend consulting engineers.

Big projects are usually not financed by the owner alone. Generally, one or more financial institutions - private, national or international - will participate in the financing.To comply with their own operating procedures and to ensure that the loans shall be used for the intended purpose and in the agreed upon form, the International agencies often place conditions on how the owner must proceed on various matters and on selection and use of consultants among them.

So, it is important for consultants to be familiar with this selection procedures. General remarks on selection procedure of some International Agencies are given in the Chapter 5 International Funding Agencies.

The formal selection process begins with the preparation of a list of consultants or firms claiming expertise in the specific field for which the client may contact professional associations of consultants, diplomatic and commercial representations, Chambers of Commerce, etc. Some banks, government agencies and investors maintain a register of consultants. It is at this stage that the first contact between the client and the consultant is made. On the basis of information obtained and after preliminary inquiries, a short list (three to five individual names or firms) is established.

In the selection of a consultant, the decisive factors may be his professional knowledge, experience and reputation. Many international organizations have established rules which are applied when they finance a project and which, in most cases, contain a rating scale for qualification.

Evaluation of proposals is the last stage in the selection process. Often, evaluation is very much a matter of personal judgment, since there are few objective yardsticks or figures. Usually, proposals are unprized, and that helps to keep the judgment objective and based exclusively on considerations of quality and not of cost. IBRD, for example, has developed a grading system whereby each evaluation factor and each proposed member of the key project staff is given a rating between 0 and 100. These ratings are multiplied by a weight factor reflecting the importance of each evaluation factor and the function each of the key members of the project staff is to perform.

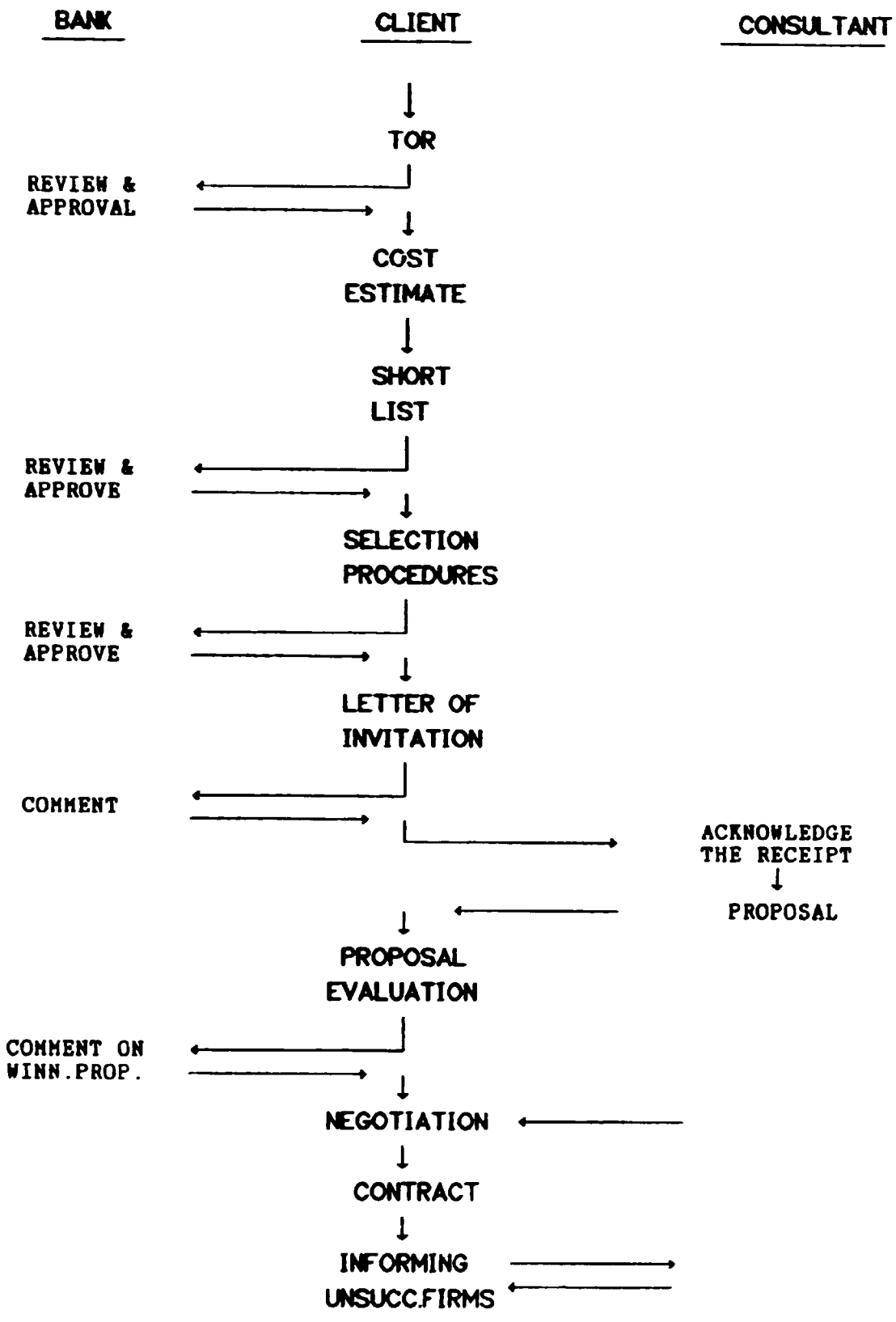
The simplified whole process from preparing terms of reference to the contract award is shown on the diagram (Page 19).

2.5 Consultant's Role in Protecting Environment

In today's critical phase of human development the consultant's mission must have strong environment overtones. There can be no question that independent consulting engineers, as "key players" in the applications of technology, must take care of the environmental consequences of activities in which consulting engineers are called upon to play a part.

In the past, engineers have unintentionally contributed to global environmental problems by designing facilities and systems that raised the quality of life for many of the world s communities, The improved quality of life resulted in lower death rates, which in turn have heightened the impacts of consumption and waste generation on the environment.

Rather than continue in this short-sighted pattern, engineers should take an active role in solving problems through practical applications of science and technology, helping world populations adapt or modify behaviors toward sustainable development.


BANK
CLIENT
CONSULTANT
TOR
REVIEW & APPROVAL
COST ESTIMATE
SHORT LIST
REVIEW & APPROVE
SELECTION PROCEDURES
REVIEW & APPROVE
LETTER OF INVITATION
COMMENT
ACKNOWLEDGE THE RECEIPT
PROPOSAL
PROPOSAL EVALUATION
COMMENT ON WINN.PROP.
NEGOTIATION
CONTRACT
INFORMING UNSUCC.FIRMS

2.5.1 FIDIC's activities

FIDIC, as an international association of consulting engineers, has responsibilities for the independent consulting engineering profession in :

- environmental policy setting;
- ensuring awareness of environmental matters within the profession;
- representation at international level on environmental policy issues;
- ensuring the profession's views on environmental matters are properly understood by clients and the public at large.

FIDIC had agreed and published a formal *Policy Statement on Consulting Engineering and the Environment*, which the member associations in 50 countries around the world are being urged to implement.

Outlining proposed ethics and responsibilities, the policy statement:

1. calls upon consulting engineers to combine their traditional skills with broader aspects of physics, chemistry, biology and other disciplines to lead interdisciplinary teams directed at achieving acceptable environmental solutions,

2. gives specific guidelines related to project action including the evaluation of the positive and negative environmental impacts of each project, based on a preliminary review of available information or on the consultant's experience and suggesting alternatives to clients if environmental risks emerge,

3. calls upon consulting engineers to "....take appropriate action, or even decline to be associated with project if the client is unwilling to support adequate efforts to evaluate the environmental issues or to mitigate environmental problems."

In connection with this role of consulting engineers a double-loyalty problem could arise, specially when the client is a government with short-term political motives, particularly in less developed countries, or when a design that protects the environment becomes more expensive than a standard one. In such cases there is a need to talk with and to try to educate the client.

The problem of the extra costs for the measures that protect the environment could be settled down by a contributions provided by rich countries. Namely, if the borrowing country in the third world agrees to an action which is clearly protective of the global environment, but which does not offer an immediate national benefit, the international funds could meet the extra costs incurred by that country.

Referring to these environmental problems there are every-day changes on legal and regulatory requirements. So, both the clients and consulting engineers should be kept informed on these changes.

Looking ahead, we may predict that Environmental liability suits against engineers may become more uniform and more frequent throughout the world. This could result from adoption of similar environmental laws and regulations, a greater public awareness of environmental problems, and a greater expectancy that polluters (and their engineers) should be held financially accountable for adverse environmental impacts.

If the legal principles proposed in the WCED report, *Our Common Future*, were adopted, engineers might be held liable for activities that were not known to be harmful at the time the engineers did their work. Thus, the engineer might be expected to predict future problems rather than being held to the standard of care that existed at the time that services were provided to clients.

By crafting a policy statement on the consulting engineer's role in protecting environment, FIDIC has sent a strong message that consulting engineers have a unique responsibility towards the environment and the concept of sustainable development.

2.5.2 Sustainable development

Nature uses close-loop self sustaining systems like the hydrological cycle. Man has a once-through use of resources. We should alter our linear approach to consumption and waste generation toward a more sustainable cycle. In this engineering model of sustainable development, the use, processing, transportation and consumption of resources must flow continuously as a closed loop to the extent possible. The manner in which we process, modify and transport resources must be conducted in harmony with the natural environment, which requires changes in manufacturer, distributor and consumer habits, particularly in the area of energy sources and usage.

The closed-loop system requires minimal waste generation, with by-products from manufacturing and consumer use being recycled many times over. Impacts of waste products must also be minimized, with programs set up for clean/up and reprocessing of old waste sites. In addition, development of biodegradable or environmentally benign synthetic products will be needed to lower our dependence on natural resources. Improved water, mineral and energy management techniques will be required to lessen negative impacts on the environment.

The World Commission of Environment and development (WCED) concluded that global decisions and actions within the next 20 years are necessary to make transition from unsustainable environmental conditions to a stable or nearly stable global environment.

All these changes in the way we impact the natural environment need planning and leadership prior to implementation. Here, the individual engineer can step forward and make a difference. There are four areas in which engineers can take action:

- Become informed about environmental issues;
- Inform others of these issues;
- Improve environmental planning on projects;
- Become leaders and decision makers regarding the environment.

Rather than taking the traditional approach to specialized engineering disciplines, individual engineers can become environmental generalist as well. Because of a historical lack of

education and training in public speaking, history and economics, engineers must also broaden their backgrounds in these and other areas.

Individual engineers can give presentations within their companies, professional associations and community gatherings to inform others about environmental issues. Participation in public hearing and legislative procedures as well as environmental awareness groups are avenues of exposing others to critical issues and technologies.

Global technology transfer is another major area needing development. "Senior mentor programs", utilizing the knowledge and experience of late-career or retired engineers could be instigated. These individuals could be of assistance as advisors to environmental agencies, engineering firms and other organizations.

"Regional development centers" should be set up to coordinate teams of consulting environmental engineers, international lenders, local university personnel and other volunteers to educate engineers within developing countries. Regional centers could be sources of long-range regional development planning, baseline environmental studies and independent reviewers of projects. Students from industrialized countries could also come to regional development centers for expanded training.

2.6 Worldwide Trade in Consultancy Services

The consultancy sector forms a fast growing part of the World trade. At present, many markets are more or less closed for foreign service providers through legal, monetary, professional or other obstacles.

Of course, there is a difference between works, supplies and services. Even amongst the service sectors, there are differences between physical and intellectual services. Even within intellectual service sectors there are differences in the sense that many think and operate as liberal professionals whereas others think and operate as providers of business services, with a more relaxed attitude.

One of the problems in the worldwide trade in consultancy services is the problem of harmonisation of professional qualifications. There is no general system of recognition of diploma. Then, there is a problem with the next level of qualification which client may want to check, and that is the past performance of consulting companies. Some developed countries operate governmental certification systems, either as a matter of governmental schemes or schemes run by the professions.

In Spain, for example, there is a system of government registration of consulting engineering companies for particular kinds of work. It is considered as a minimum guarantee of quality. In France, the engineering companies operate a system of regular inspection and certification, operating on a professional level working with volunteers as arbiters.

Consultants operate in the very different conditions in various parts of the world and the very different legislation and code of practice. In the most of developing countries there are no national association, of consultants and code of practice.

In the area of public procurement the problems are in discrimination of private sector and "transparency" - the larger part of the public sector market is not opened up for competition.

Recently, the proposal was drafted for the EC Directive on Public Procurement of Services. One of the problem was how to cover a heterogeneous field of activities, ranging from cleaning to intellectual services, by one set of rules.

An extensive survey of the consequences of the single European market in 1992 for consulting engineers, initiated by the FIDIC Member Association in the Netherlands, (ONRI), has been carried out in conjunction with the FIDIC Member Associations in the UK (ACE) and Denmark (FRI). Each report (for each EEC country) in the survey covers the supply and demand situation for engineering consultancy services, discusses the sources of these services and the area of demand for them. A national profile and description of the provision of engineering consultancy (type, selection procedures, fee structures etc.) is given, followed by a survey of the following main categories:

- transport and infrastructure,
- building services,
- environment,
- water resources management,
- energy, and
- other sectors (general).

MARKETING

[illegible]

Zagreb, Croatia

MARKETING

Z. Morvaj, ENCONET International

Zagreb, Croatia

3.1. Definitions

There is a lot of various definitions of "marketing". For the purpose of these Manual we define Marketing as the process of planning the conception, pricing, promotion, and distribution of goods and services to create exchanges that satisfy individual and organizational objectives.

Other definitions view the dynamics of the marketing process on either micro level of the individual company, or the macro level of society as a whole.

On the micro level, the marketing process is defined as: A total system of business activities which directs the flow of goods and services from producer to consumers or users to satisfy customers and accomplish company objectives.

In our case MARKETS are sets of actual or potential buyers who have a willingness and the means to purchase and demand energy conservation projects.

Steps in the marketing process:

All the activities in the marketing process can be grouped into four main steps:

1. To identify unsatisfied needs in the market place.

2. To develop and carry out marketing plans or programs to satisfy these needs.

3. To identify and define worthwile target markets.

4. To create service/price/place/promotion marketing mix offerings to attract target market members.

3.2 Market Characteristics

In the developing countries the industrial and power sectors offer the largest and most easily captured energy conservation potential. Energy conservation is a cheap, quick and relatively easy way for most developing countries to stretch energy supply, reduce energy costs and save foreign exchange. Thus energy conservation could be conceived as replacement of supply so it must compete with the supply side enhancement.

Comprehensive analysis based on more than thirty developing countries' experience indicate that, contrary to the general opinion the rate of implementation of energy conservation projects turn to be quite high. The majority of these projects in the countries investigated have mainly been no-cost or low-cost measures. The rate of implementation of projects during the past ten years that do require significant investments has been much lower even for projects with payback times less than two years. These facts support the conclusion that many energy conservation investments that are cost effective, are not being made or having a long delay. The majority of the identified and implemented projects have payback times of two years or less. In the developing countries among the technical options the improvement highest rate of implementation, mainly because electric utilities have been promoting power factor improvements among their consumers. Waste heat recovery accounts for the largest share of projects implemented, it has generally had a low implementation rate. This low implementation rate may be due to the fact that waste heat recovery projects are perceived as risky ones and require extremely precise and sophisticated engineering. There does not appear to be a significant difference in the overall rate of implementation between oil saving and electricity saving projects.

3.3 Marketing Plan

The market for an independent energy conservation consulting company is characterized by the need and intentions of the potential clients, but there are several obstacles in the way to generate business on energy conservation field in the developing countries.

Providing financial arrangements for conservation actions

The most common barrier to undertake conservation measures is the limited ability or the reluctance of the potential clients to acquire and deploy the capital needed to develop these opportunities. Industrial firms in the developing countries have had frequent opportunities in recent years to benefit from the use of new, more energy efficient production technologies, but insufficient internal cash, combined with inability to raise debt or equity capital under favourable terms have often prevented firms from funding these investments.

Confronted with such impediments to mobilizing capital for conservation investments, an independent energy conservation consulting company must use innovative financial arrangements recently implemented by some financiers and entrepreneurs in industrialized countries

for the energy conservation related investments in the developing ones. These are more detailed elaborated in the chapter 4. Financing.

Third party financing

The third party financing is a special market option which means the packaging together of both technical aid and the necessary funding for energy efficient investments by an outside company. This is highly appreciated by the relevant international institutions e.g. by the European Commission. According to the outcome of these investigations the market potential for third party financing is huge as a paper by the European Commission "Energy Efficiency Investments Through Third Party Finance" has estimated, to achieve the global energy saving target of 70% by 1995, endorsed by the Council of Ministers, would require an investment of 50 BUSD in the industrial sector, to achieve savings of 42 million tonnes of oil equivalent.

An independing energy consulting company may act generating third party financing and as a coordinator of a range of services, from technical to financial ones. Since the return to the energy consulting company is dictated by their ability to accurately predict the level and timing of energy costs savings, technical skills, or access to those technical skills is crucial to the profitability and even continued existence of the company. However it should be noted that it is not necessary for an independent energy consulting company to have all the technical expertise in-house. This expertise can be hired as necessary. The third party financing is more detailed elaborated in the chapter 4. Financing.

International financial resources for energy conservation in developing countries

As it has already been mentioned the lack of appropriate financial funds is the most important barrier to undertake energy conservation measures in the developing countries, so this means a stringent restriction of the activity of an independent energy conservation consulting company, too. To overcome this common barrier it is vital and necessary to generate the appropriate market for an independent energy conservation consulting company's capability on the project development, training, consultancy and conservation investment field.

Many international institutions have direct sponsoring programmes for the improvement of the energy efficiency in the developing countries and financial resources for the economic development for the developing countries. Many governments of the industrialized world have bilateral aid programmes possessing energy rationalization component for various countries in the third world and brand new for the Eastern European countries, too.

To assess and evaluate the market penetration options and to set up strategies for the market development, it is crucial to be aware of all these opportunities, the different financial channeling systems for conservation projects in the developing countries, and the possible financial resources.

Cooperation with competitors

The cooperation with competitors is another option to grab bigger market slice. Special contracts can be established with another energy consultant firms for the sake of a mutually beneficial division of work between them. The company would exploit the special condition

given by the cheaper expertise, the special skill needed to be effective in the market of developing countries, or even an existing contract to the market. Effective combination of the own capabilities and that of a consulting firm of developed country can be considered not necessarily only occasionally, but even for long run having an agreement to split the work, which could include the following:

- monitoring energy conservation market;
- generating promotion of energy efficiency;
- understand the local context within which the market's enterprises energy policies and behavior are developed;
- study of fiscal and financial aspects of energy developments;
- identification and resolution of issues related to energy and the environment concerning local market conditions;
- strengthening of international collaboration on energy conservation issues;
- generate increased funding for energy conservation measures in the local market.

Cooperation with local institutions

Besides collaboration with energy consultant companies of the industrialized countries, it is important to build contacts to similar organizations of the countries representing the market. The integrated approach may be an effective way to address certain specific technical, implementation or training and institutional development needs. The cooperation with local institutions will then serve as a basis for determining the best ways to meet the most critical local needs in some particular case. Some of the topics of this type of collaboration should be:

- diagnoses, generally by mutual efforts, of conservation problems in key sector institutions/enterprises with recommendations and preparation of terms of reference for further implementation programmes;
- in-country services (training) consultancy to meet specific specialist needs such as energy conservation planning, economics, finance, technical specialties;
- defining the specifics of technical assistance and pre-investment activities, including objectives, work plan and required local inputs in a format the client can use in discussion with official bilateral and multilateral financing agencies or with interested private investors;
- helping the client to identify sources of finance both public and private, for each of the follow-up activities identified during the mutual assessment, this can include arranging special meetings or seeking financing through bilateral discussions with individual financing agencies.

Due to the wide range of activities achieved by the company providing services on the topic of consultancy, training, project development relating almost all kind of energy conservation issues at the level of factory/enterprise or national/regional involving technical/technological, institutional/management and financial / economic aspects of energy conservation issue, it is possible and desirable to give options to other firms having similar profile to joint the company. By the growth new markets can be attained.

3.4 Target Markets

Another important job in the marketing process is to identify and define groups of people or institutions, called TARGET MARKETS.

There are two types of potential clients:

- governmental or non-governmental organizations, and institutions which represent interests in energy conservation mainly at national/regional level and which are not directly profit oriented in the course of conservation actions;
- industrial companies and other economic entities which are cost sensitive and directly involved in the economic benefits of the energy efficiency improvements.

The two main groups of the potential clients have different financial, organizational and economic background and needs and they should be differently approached, taking into consideration their special requirements.

The non-profit oriented, policy making organizations and institutions would be benefited by the services of an independent energy conservation consulting company because:

- energy conservation policy making processes could be enforced within industrial organizations by developing and disseminating the results of meaningful and synthesized bodies of technical, financial, economic, legal, regulatory, socio-cultural and other knowledge to operational organizations in the private or public sectors to implement energy conservation projects;

- the allocation of sufficient financial resources would be encouraged and research/development / demonstration funds would be effectively applied to qualified organizations on an objective basis;

- international cooperation on a bilateral, sub-regional, regional and global basis would be strengthened in the field of energy conservation measures;

- a sophisticated engagement would be provided in more objective forward-looking energy assessment and planning processes from the points of view of energy availability, pollution abatement and cost efficiency among many other factors juxtaposed to credible alternative conservation solutions and implementation over a planned and phased time period.

The profit oriented industrial enterprises, firms and other organizations would gain benefit by accepting the services of an independent energy conservation consulting company, because it provides:

- easy access to all available energy conservation related information on an international, national, sub-regional, regional basis in order to facilitate cost effective allocation of plant, human, financial and development resources;

- precise identification of credible short, medium and long term requirements and justification of technological and project development expenses in engineering, production, marketing and other services;

- housekeeping and operational improvement: it is a comprehensive summary of measures to reduce energy use that can be taken by a plant engineer or plant operator with little or no cost and in a short time, such as:

  - regular control of efficiency of boilers, including measures on fuel consumption, flue gas temperature and CO/CO_2 content, combustion air temperature, etc.;
  - control of compressed air systems including temperature reduction of the aspirated air, compressor maintenance, etc.;
  - control of steam or hot water systems, including condensate leak, water or steam leak, damaged or missing insulation, etc.;
  - others, such as: heat recovery on wet gas steams recirculation on drying systems, improve economizer of boilers, condensing heat recuperating systems of both direct and indirect type, etc.;

- waste heat recovery and reuse:

  - flue gas,waste heat recovery of boilers and kilns, turbines etc, which represent relatively high temperature source of energy methods and devices to reuse these waste energies;
  - process steam condensate and refrigeration condensers, cooling zones of kilns and driers outlet represent low temperature heat sources and their utilization needs more sophisticated economic/technical analysis;

- electric system improvements: it contains load management measures and energy saving study on:

  - electric motors for heating and ventilation systems;
  - lighting which many times could be connected to more efficient high intensity lamps;
  - reactive power consumption and its compensation, the necessary capacitive power for compensation;
  - variable-speed drives improve the operation of large fans and pumps by matching their speed to power demand;
  - process modification and cogeneration which does not need necessarily substantial change in the processes applied by the production technologies, but mainly contains components of minor modification, such as:
  - change of burners;
  - increasing cooling capacity;
  - installation of mixing fans to the preheating zone etc.

- Cogeneration, which denotes any form of joint production of electrical or mechanical energy and useful thermal energy, either by producing electricity first and using the exhausted thermal energy for other purposes (topping systems), or using thermal energy from a waste stream to produce power (bottoming system). Co-generation benefits arise primarily from the higher overall efficiencies in a combination process compared with the cost of producing the needed power and heat through separate processes, so primary fuel cost can be reduced substantially, typically between ten and thirty percent.

3.5 Types of Energy Conservation Services

Based on all mentioned before, service packages and project proposals should be developed. The investigations carried out in the developing countries indicate that an independent consulting company should be able to perform some of the following functions:

- to provide technical/management/economic services which would consist of research, training, consultancy, information exchanges and capacity building on different systems, to be accomplished by means of research collaboration, training courses, workshops, case studies. study tours etc.;

- to provide assistance to execute successful industrial energy rationalization programs in the countries and to provide technical assistance and different advisory services;

- to facilitate energy conservation surveys and data-base development, promoting installation of energy efficient devices or equipment by soft loans, preferential tax treatment and implementing adequate regulations and laws, and establishing standards to promote energy conservation;

- to assist establishing new institutional arrangements needed to design the appropriate energy rationalization program in the developing countries, to ensure coordination and assume responsibility, and to organize campaigns for energy awareness and energy conservation knowledge.

The emphasis should be on the service quality rather than price. Arguments for this we can find on the selection procedures of International funding institutions.

3.6 Promotion Activities

To act successfully on the market described above, an independent energy conservation consulting company need to develop an "image", a specific profile which enables customers to identify it and, at the same time to distinguish it from other consulting or service companies.

The identity of a company is basicly determined by the "persuading force" of its advertisement. slogans, logos and which is the most important by the capabilities of the company to provide valuable services for the potential clients.

Each group of the potential clients has different financial, organizational and economic background and needs and it should be differently approached, taking into consideration its special requirements.

Two types of potential clients have already been mentioned:

* The non-profit oriented organizations and institutions at the governmental level, i.e. mostly governmental organizations which would have programmes for energy conservation supported by the international financing resources. In this case the Company would offer to:

- set up independent working group, specialized team for adequate planning and decision making at national and regional or local and enterprise level;
- establish organizational body responsible for development and conduct national energy survey on an adequate date base, which will be responsible for the identification of the constraints and barriers to energy savings and their possible removal;
- analyze existing institutions and recommend changes and a comprehensive review of legislation and regulations including pricing policy and proposal for modification;
- establish institutions providing services for engineering, audit and consulting support outside plants to implement conservation measures especially in-depth energy auditing at enterprise level, waste energy recovery and for continuous monitoring and supervision of energy management issues;
- initiate, organize and execute awareness campaign or government, companies and individuals about the importance of energy conservation and about the opportunities which exist for making savings;
- set up department or other institutional agencies at government level (in government) with clear responsibility for design and implementing energy policies and for legislative and/or regulatory measures supporting energy management issues;
- establish and operate advisory service to provide information about available conservation programmes, technologies and techniques. This service is in addition to an energy conservation center;
- introduce coherent and comprehensive energy efficiency standards for energy consuming equipment (e.g. refrigerators, hot water heaters, transport vehicles), besides introduction advertisement campaigns are to be conducted by issuing booklets and guiders.

* The second major group of customers are profit oriented enterprises and firms which would need services for special financial arrangements for conservation investments and other technical services, such as:

- assurance of availability of suitable energy efficient equipment and of energy measuring instrumentation or monitoring facilities at company level;
- energy housekeeping analysis, including fuel or energy carrier leaks, insulation problems, burners adjustment, dirty surfaces, improper operating pressure and temperature;
- reuse of waste energy, such as flue gas heat recovery and other recuperative energy transformation;
- cogeneration, which can be applied in many cases as bottoming cycle, or as waste heat recovery for low temperature heat demand;
- energy systems (heat, steam, electricity) improvements and process modification including load management to manage power peaks and installation of load shedding equipment;

- improvement of maintenance and retrofitting, especially at electrical systems, e.g. installation of variable speed control, correction of power factor, installation of high efficiency motors, lighting, transformers etc.;
- provision of technical assistance to overcome the lack of knowledge and technical expertise about possible energy efficiency possibilities or measures;
- improvement of arrangements for technological innovation and dissemination;

In the consulting service sector, emphasis is on marketing, rather than "production" activities. Consultants can not put their "intelectual product" in the shop window. So, an important purpose of the marketing process in the consulting service sector is to create and resolve relationship with potential clients, to encourage and facilitate projects from which the both parties will benefit. It can be done only by "an aggressive marketing", i.e. by a direct contact with the potential client. The benefits for the client have to be emphasized in a carefully prepared presentation.

Proceedings of the
THE WORKSHOP ON CONSULTING SERVICES IN ENERGY CONSERVATION
Zagreb, Yugoslavia, May 13 - 17, 1991

FINANCIAL ARRANGEMENTS FOR CONSERVATION ACTIONS IN DEVELOPING COUNTRIES

L. Lengyel, National Authority for Energy Economy,

IMP-OEGH, Budapest, Hungary

Proceedings of the
THE WORKSHOP ON CONSULTING SERVICES IN ENERGY CONSERVATION
Zagreb, Yugoslavia, May 13 - 17, 1991

FINANCIAL ARRANGEMENTS FOR CONSERVATION ACTIONS IN DEVELOPING COUNTRIES

L. Lengyel, National Authority for Energy Economy,
MP-OEGH, Budapest, Hungary

4.1 Generally

The most influential factor of the market is the availability of financial funds and national or international support to implement energy conservation measures in the developing countries living in the age of the capital shortages.

Many international financial resources enable an energy consulting company to be involved in energy conservation issues which are financially appropriately backed. There are many international institutions having budgeted programmes for energy conservation in the Third World. Many governments of the industrialized world have bilateral aid programmes possessing energy rationalization component for various countries in the Third World , but special local fund generation need also be taken into consideration such as third-party financing and other options.

Industrial firms in the developing countries have had frequent opportunities in recent years to benefit from the use of new, more energy efficient production technologies, but insufficient internal cash, combined with inability to raise debt or equity capital under favorable terms have often prevented firms from funding these investments.

Limited ability or the reluctance of the potential clients to acquire and deploy the capital needed is still the most common barrier to undertake conservation measures.

Confronted with such impediments to mobilizing capital for conservation investments, an independent energy consulting company must take an active role in finding innovative financial arrangements. Good examples can be find in financial arrangements recently implemented by some financiers and entrepreneurs in industrialized countries for the energy conservation related investments in the developing ones. These arrangements are elaborated on the following pages.

Moreover, trade flow can be used as a basic and essential element of many financial packages. However, that means that the financial package must include not only engineers and bankers, but also importers and exporters.

Finally, there are numerous risks associated with every project. The aversion of many banks and companies to take risks in developing countries explain the difficulty of designing successful financing packages. The point is that every risk must be accounted for and allocated, and there are many possibilities for risk reduction or transfer which will be elaborated at the end of this chapter.

4.2 Financial Arrangements for Conservation Actions in Developing Countries

4.2.1. Shared-saving Arrangements

In this type of financial arrangement a shared-savings firm first identifies and evaluates the conservation investment opportunities at the energy user's facilities. This evaluation is usually undertaken at no cost to the energy user. However, the energy user will usually be liable for reimbursement of the cost of the detailed engineering and financial evaluation if the shared-savings firm identifies investment opportunities that it is willing to finance but the energy user refuses the firm's financing offer and undertakes the investments itself.

On the basis of the evaluation the shared-savings firm and the energy user negotiate the shared-savings agreement. The agreement includes procedures for establishing the quantity and value of energy savings. With regard to a sharing formula, a common arrangement is for the share-savings firm to receive 60% of the value of savings for 5 years after the installation of an improvement and 40% for the second 5 years. In addition to receiving a share of the gross value of savings, the share-savings firm also usually receives any tax benefit associated with the investment. The agreement also addresses such matters as procedures for managing and maintaining the conservation improvement, because income to the shared-savings firm depends on the performance of the improvement, the shared-savings firm has a strong interest in ensuring that the improvement is maintained and operated efficiently.

Once the shared-savings firm and the energy user have negotiated the agreement, the firm finances and undertakes the conservation improvement. The firm may remain the sole owner/investor in the project and finance the improvement from its own financial resources. However, as an increasingly frequent alternative the firm may syndicate the investment as a limited partnership with other investors then providing the bulk of the investment funds. The typical financial structure of the shared-savings arrangement would be 30-40% equity leveraged with 60-70% debt. Occasionally, the debt may be project-secured.

After the improvement is completed the firm and the energy user operate under the negotiated agreement, sharing the value of energy savings according to the savings formula. In a shared-savings financing arrangement, the energy user is able to eliminate all or part of several important risk elements that it would otherwise bear in undertaking a conservation investment.

4.2.2. Joint venture Arrangement

Joint venture arrangement between an energy user and an external investor is essentially a special variation of the shared-savings arrangement. An external investor provides most or all the capital investment required to undertake an energy conservation project. The energy user provides the site/opportunity for the investment. However, in contrast to the shared-savings agreement, the investor and the energy user have more flexibility in tailoring the joint-venture arrangement to suit their specific risk/return objectives. The flexibility afforded by the joint-venture arrangement makes this financing arrangement attractive for large industrial projects where both the energy user and the external investor wish to control the construction and operation of the project.

In a joint-venture arrangement the external investor and the energy user form a separate investor entity to manage the construction and operation of the conservation project. The investor entity might be a corporation, a general partnership, or a limited partnership. For example, in a limited partnership, the energy user may assume the role of general partner, with the external investor(s) acting as the limited partner(s). Under this arrangement, the energy user retains management control over the construction and operation of the conservation improvement, while the external investor/limited partner receives the tax benefits of project ownership.

The financial structure of a joint venture is usually similar to that of a shared-savings agreement, and typically consists of 30-40% equity and 60-70% debt. For some investments the debt may be project-secured. However, the debt will more generally need to be supported by the assets of the external investor or the energy user, or both.

The financing benefits of a joint venture depend on the terms of the specific agreement. Generally, the external investor is responsible for providing the bulk of the capital required for the conservation project. As such, the energy user will receive its share of the benefits of the conservation improvement with little or no front-end investment being required. Whether a joint venture will provide off-balance-sheet/off-credit financing will depend on the extent of the minimum payment and debt support obligations assumed by the energy user.

A joint-venture agreement specifies procedures for sharing the benefits of constructing and operating the conservation improvement. As in a shared-savings agreement, revenue to the joint venture is generally determined by first estimating the energy costs the user would have incurred in the absence of the conservation improvement, and then subtracting actual energy costs from the estimated costs.

4.2.3. Energy Service Agreement

Energy service agreement is similar to shared-savings financing arrangement in that an external investor provides the capital for conservation improvements at the facility of the energy user. As with the shared-savings agreement, the energy user makes no cash outlays and incurs no

financial obligations in allowing the energy-related capital improvement to be installed. However, the agreement differs from the shared-savings agreement in the manner in which the energy consulting company / external investor receives its financial return.

Under an energy service agreement, the energy consulting company / external investor agrees to provide the energy user with specified energy services (e.g. heat and air-conditioning, hot water, lighting and refrigeration) at a fixed aggregate cost or unit price that is less than the cost the energy user would incur for the specified energy services in the absence of the conservation improvement. The aggregate cost or unit price will often be specified as a fraction (e.g. 80-90%) of the energy costs that would have been incurred in the absence of any energy-related investments.

The energy consulting company installs those conservation improvements that it has identified as being economically advantageous and necessary to earn an adequate return, given the pricing agreement for providing energy services. After installing the conservation improvements, the user firm generally receives the tax benefits (i.e. depreciation and investment tax credits) user pays the energy consulting company, and the energy consulting company is responsible for all payments to utilities and fuel suppliers.

The energy consulting company earns a return on its conservation investment by providing the specified energy services at a cost that is less than the amount paid by the energy user to the energy service firm/external investor for the energy services. In addition, the energy service firm generally receives the tax benefits (i.e. depreciation and investment tax credits) associated with ownership of the conservation improvement. The energy consulting company may finance the conservation improvement from its own corporate resources, or may syndicate the investment to other investor (e.g. through a limited partnership).

As in a shared-savings agreement, the energy service firm is fully responsible for maintaining the conservation improvement during the term of the energy service agreement, which typically ranges from 6 to 12 years. At the end of the service agreement the energy user generally has the option of renewing the agreement or purchasing the conservation improvement.

4.2.4. Variable Payment Loan

Variable payment loan differs from the three preceding financing arrangements in that the external funds are provided through debt rather than an equity-orientated financing, and ownership of the conservation improvement accordingly rests with the energy user. The variable-payment loan incorporates two features that are designed to assist the energy user in financing a conservation project:

- The debt payment schedule is structured so that the debt payment in any period will probably be less than the value of energy savings achieved in that period. As a result, an energy user should achieve a positive cash-flow on a conservation investment immediately after installation of the conservation improvement and throughout the period during which the loan is being repaid.
- Subject to a minimum payment, loan payments are set to vary directly with the value of energy savings. That is, the higher the implicit cash flow from energy savings during a period, the higher the energy user's debt principal payment in that period. The variable-payment provision is designed to reduce the aversion of

many energy users to assuming fixed-repayment obligations for conservation improvements that produce energy savings that may vary over time and that are virtually certain to produce negative cash flows at some point, usually early in the repayment period.

The specific structure of a variable-payment loan depends on the willingness of a creditor to accept an uncertain debt retirement stream. Under a typical structure, the conservation financing organization or other creditor evaluates the conservation opportunities at an energy user's facility. For economically attractive opportunities the creditor extends a loan to cover a substantial share (e.g. 80-100%) of the cost of installing the conservation improvement. The creditor and energy user then agree on a formula for estimating the cost of energy that the energy user would incur without the improvement. The energy user agrees to pay the creditor a loan payment in each period equal to a fraction (e.g. 75%) of the energy cost savings in a period. The savings equal the difference between the projected energy costs without the improvement and the actual energy costs. In addition, the loan agreement specifies a minimum loan payment, which is usually the payment required to retire the loan in 1.5-2 times longer than the repayment period that would occur if the improvement performs to expectations in achieving energy savings.

Because the energy user remains liable for minimum loan payments in each period the variable-payment loan generally does not provide off-balance-sheet/off-credit financing for a conservation project. However, the loan arrangement offers significant financing benefits by providing the energy user with positive cash-flow immediately after installation of the conservation investment and by largely reducing the risk associated with the fixed-payment obligations of a traditional loan. Moreover, because external financing is provided through a loan, the energy user retains ownership of the conservation improvement and, accordingly, receives the tax benefits (i.e. depreciation and tax credits) associated with the conservation project.

4.2.5. Guaranteed-payback Loan

Limited term, guaranteed-payback loan is similar to the variable payment loan in that the sum of payments for actual energy use and loan repayments cannot exceed the energy cost that would have been incurred in the absence of the conservation improvement.

However, in a key difference with the variable-payment loan, the creditor in a limited-term, guaranteed-payback loan accepts the risk that a conservation improvement may not achieve payback within a specified period. Thus, the creditor shares directly in the risk of the technical and economic performance of the project.

Procedures for initiating a limited-term, guaranteed-payback loan are similar to those for a shared-savings financing arrangement. The creditor first evaluates conservation investment opportunities at an energy user's facility, and then provides debt financing for up to 100% of the capital requirements of those opportunities that meet the creditor's expected return criterion. The debt repayment terms include a guarantee from the creditor that the value of energy saved by the improvement will be adequate to retire the loan within a specified period of time (i.e. the limited term), typically, 1.5-2 times the loan amortization period thatwould be anticipated if the improvement achieves the expected level of technical and economic performance.

The debt repayment mechanism works as follows. After installing an energy improvement the energy user makes periodic payments to the creditor equal to energy costs that would have been expected without the conservation improvement. The creditor pays the energy user's energy or utility bills, and uses the residue to amortize the loan. Depending on the terms of the loan agreement, the creditor may provide a cash rebate to the energy user to offset the energy user's net cash tax liability on income generated by the conservation improvement. If the energy savings are insufficient to retire the loan within the specified term limit on the loan, the creditor forgives the remaining principal balance on the loan. In this arrangement the energy user keeps the tax benefits associated with project ownership, which partially offset the tax liability on the incremental income from the project. After the loan has been retired or forgiven, the energy user resumes responsibility for energy and utility payments and receives the full value of energy saving produced by the conservation improvement. Accordingly, the energy user has an incentive to maintain the conservation improvement and achieve maximum energy savings during the loan repayment.

The guaranteed-payback loan generally offers significant financing benefits to the energy user. For example, under this financing arrangement, conservation improvements are installed at little or no out-of-pocket cost to the energy user. In addition, the loan arrangement generally qualifies for off-balance-sheet/off-credit financing because the energy user is not obligated to retire the loan or, indeed, even to make loan payments.

The innovative financing arrangement described above could be one of the main market shares of the Company by assisting developing countries the flow of capital into conservation investments that might otherwise go unfunded. However, using these financing arrangements requires that financial institutions are able to evaluate the technical and economic risks associated with energy-related investments. In addition, the institutions must be willing to assume certain risks associated with the innovative financing arrangements. In return for accepting these risks, the creditors can expect commensurately higher returns than might be obtained by offering conventional loans to finance energy-related investments. Government can play various roles in promoting the development of the necessary financial infrastructure and the use of these innovative financing arrangements.

The most direct public-sector role to assist in promoting use of innovative financing arrangements for energy-related investments would be to form a publicly-chartered finance corporation that would be authorized to engage in any of the financing activities discussed in the preceding section. This corporation would be initiated with public capital. However, after a period to start-up operations, the corporation would be able to gain access to private capital and perhaps become completely independent of government support.

Another government role would be to sponsor demonstration of the financing arrangements. Such demonstrations would be conducted pointly by a public agency and a private organization (e.g. a commercial bank, investment bank, or utility firm). The public would provide technical assistance in identifying appropriate investment opportunities and in structuring the financing arrangements. The government might also guarantee the return of capital for the projects or provide other incentives if such incentives were needed to entice private sector participation in the demonstrations. Demonstration programs have been helpful in encouraging the use of energy-saving technologies and innovative methods for financing investments in conservation technologies.

Proceedings of the
THE WORKSHOP ON CONSULTING SERVICES IN ENERGY CONSERVATION
Zagreb, Yugoslavia, May 13 -17, 1991

THIRD PARTY FINANCING

G. V. Oniunas, PLB Projects Limited,
London, England

Proceedings of the
THE WORKSHOP ON CONSULTING SERVICES IN ENERGY CONSERVATION
Zagreb, Yugoslavia, May 13 -17, 1991

THIRD PARTY FINANCING

S. V. Jelunas, PLB Projects Limited,
London, England

5.1 Third Party Financing

Third party financing is another option for an independent energy consulting company to mobilize capital for conservation investments. In that case an independent energy consulting company must be able to offer both technical aid and the necessary funding for energy efficient investments by an outside company.

This type of financial arrangements is highly appreciated by the relevant international institutions e.g. by the European Commission. The market potential for third party financing is estimated to be very large.

In that case an independent energy consulting company may act as a coordinator of a range of services, from technical to financial ones. Increased financial and technical expertise can be hired as necessary.

Generally, third party financing arrangement need the following actions to be undertaken:

A Initial Audit:

The first stage of the contract involves the energy consulting company carrying out a preliminary energy survey; usually a simple general energy audit suffices. On the basis of this survey, and details of past energy bills and other background information about the facility, the energy consulting company will decide whether there is sufficient cost-effective energy saving potential present to make an energy performance contract feasible.

B Contract Negotiation:

If the initial survey is sufficiently favourable, the energy consulting company will propose a contract to the supplier, and the negotiation of the contract commences. While this might appear to be rather an early stage for detailed contract negotiation, the energy consulting company will not proceed to the next step - investing in the time and cost of a detailed energy audit without some commitment on the part of the energy user.

In order to be able to measure energy savings the two parties must agree upon a 'baseline' consumption, that is an adjusted historical level of energy consumption, from which the energy savings will be measured after the investment has been made. Successfully negotiating and implementing an energy performance contract requires a "partnership" approach from both parties - without such an attitude a successful agreement will be extremely difficult to conclude.

C Detailed Audit:

The detailed energy audit of the facility is the first step in implementing the contract. If the detailed audit verifies potential for cost-effective energy savings, the energy user has two choices:
(i) to proceed with the contract, with the cost of the audit being met by the energy consulting company as apart of their overall project costs;

(ii) to end the contract, paying the energy consulting company for the cost of the detailed energy audit.
Before the actual implementation of the project can take place the two parties must agree the specification of the improvements.

D Detailed Engineering Design and Installation:

In the next stage in performing the contract the energy consulting company will carry out and fund the detailed design work, the installation, and the commissioning of the energy saving improvements.

E Operation of the Contract:

When the improvements have been installed, the new level of energy consumption will be compared with the 'baseline' consumption previously agreed, and energy cost savings computed. How exactly these savings are used to repay the energy consulting company depends upon the exact nature of the arrangement used by the two parties. Common types of arrangements are shared-savings contracts; contracts where 100% of the savings go to the energy consulting company until the project is paid off; and arrangements where the energy user is given a guaranteed cost saving upon the previous energy bill.

F Termination of the Contract:

Normally the equipment installed through the energy performance contract remains the property of the energy consulting company until the contract period is ended. If the contract

has been successfully concluded, the equipment can either be transferred at no cost, or in some cases the ownership is transferred to the energy user from the outset. This depends upon the tax situation of the two parties and upon the preference of the energy consulting company.

5.2 Securities, Guarantees and Risks

5.2.1 Securities and Guarantees

Project Finances can be generally classified into three types:

a) With Recourse. This means that the finance is fully covered by an appropriate and credit-worthy guarantee. This could be a personal guarantee of the sponsor, an appropriate government guarantee, or an unconditional "take or pay" contract with price guarantees. The term credit-worthy is, of course, open to dispute.

b) With Limited Recourse. The guarantees in such a case are limited by conditions. For example, there may be a "take or pay" contract, but the purchase may depend on the quality of the product, the world market price i.e. the price is not guaranteed, or delivery conditions. Limited recourse may also imply Government assurances related to performance of the companies involved, to the issuance of export licenses and security over the assets of the project.

c) Without Recourse. This means Project Finance in its strictest and narrowest meaning, that is, the lender has only the assets and cash flow of the project itself as a guarantee for payment. If the project is shown on the balance sheet of the investor, then this cash flow may be enough for lenders. If the project is to be an "off-balance sheet" financing, then additional assurances will be necessary, such as long-term supply contracts, completion guarantees, government assurances, etc.

It is clear, that the Viability of the project (profitability) must be increasing as we move from Recourse to Non-Recourse funding.

5.2.2. Identification of Risks

Although it is very obvious that there are numerous risks associated with a project, let us remind ourselves of the categories of risk as seen from an investor's or lender's point of view. Broadly speaking, these can be divided according to the stages of a project's life, although in many cases the risks overlap and continue over the course of the project. Although there can me many more risks than those mentioned here, for the purpose of this Manual all the risks will be broadly classified into the following groups:

- precommissioning risks,
- post-commissioning risks, and
- general developing country risks.

A Pre-Commissioning Risks are those which can lead to start delays, cost overruns and project abandonment. These include:

- *Technical risks* - those risks inherent in the technology, or the ability to apply the technology to the specific circumstances of the project.
- *Raw materials risks* - those risks associated with the exploitation, availability or deliverability of the basic feedstocks for the project in sufficient economic quantities.
- *Development and engineering risks* - related to the location of the project, its suitability, the use of materials, the development of ancillary projects such as pipelines, transmission lines, port facilities and so forth.
- *Capital cost and construction delay risk* - the effect of these risks depends on the qualifications of the project engineers and constructors, their financial security and the confidence of the project lenders. In combination with technical and engineering risks already mentioned, this area will be analyzed most closely by the project lenders.
- *Installation and performance risk* - the risk that the carefully planned and engineered project is not actually built according to the foreseen specifications due to local conditions or lax supervision.

B Post-Commissioning Risks are those which may affect the project cash flows and revenues once the project is underway. These include:

- *Technical Risks* - malfunction of production or transport systems leading to a requirement for increased capital costs.
- *Raw Materials Risks* - an interruption of supply of raw materials during the project's operation.
- *Other Operating Risks* - the risk that the project will not be operated according to the foreseen plans due to lack of labor, services, qualified personnel or any other reason.
- *Market and Price Risks* - the risk that market size and price projections upon which the project was conceived and funded do not materialize, or that the price of raw material inputs to the project vary greatly from those projected.
- *Inflation Risk* - the risk that operating costs are significantly above those projected due to unforeseen inflation levels.

C Developing Country Risks

- *General Political and Legislative Risk* - Apart from discontinuities caused by war or revolution, governments can, through legislation and decree, change the environment in which the project operates, causing changes in projected cash flows. Abrogation of agreements or guarantees agreed by the government, or new conditions placed on the project once it is operating are possible in the short term. In the long term, the general political climate, as well as governments and political systems may change.
- *Currency Convertibility Risk* - The ability to use foreign exchange earnings as foreseen, and/or the ability to exchange local currency and to re-patriate it, will

depend on the foreign exchange position of the country and its projected earnings and borrowing.

- *Interest Rate Risk* - An increase in the interest rate on project debt, which will result in a higher debt service for the project.
- *Foreign Exchange Risk* - Revenues and Loans may be denominated in different currencies, resulting in potential losses from currency fluctuations. In some countries, notably Pakistan, Exchange Risk Insurance is available from the State Bank upon paying a substantial premium.
- *Force Majeure Risk* - Those risks which arise that are beyond the control of the parties, both casualty risks and non-casualty risks, a number of which may be insurable.
- *Breach of Shareholder's Undertakings* - This is especially relevant in the case of joint-venture projects, especially with regard to cost overruns.

5.2.3. Risk Reduction and Allocation

The essence of Project Finance is the identification and allocation of risk. The following two Exhibits show some of the possibilities for risk reduction or transfer (Source: Project Financing by Christopher Emerson, Financial Times Business Enterprises Ltd. 1983).

5.2.4. Insurance

Of this menu of risks, those that are insurable, and those that are not will depend on the project, the country, the sponsors, and the ability of the sponsors to tap the possible sources of cover. In general, the following types of insurance may be considered standard on larger projects -

<u>In the Pre-Commissioning Period</u>

Marine Cargo Insurance (including war risks) covering imports of plant, equipment and materials to the project site.

Contract Works Insurance covering loss or damage to the project during the construction and commissioning periods.

Business Interruption Insurance covering loss of revenue or increased costs due to damage to equipment or materials during transit or construction leading to project delays.

Third Part Liability Insurance covering legal liabilities to third parties for injury or damage arising from construction.

Local Insurance such as workman's compensation and motor vehicle insurance.

<u>In the Post-Commissioning Period</u>

Material Damage Insurance covering fire, specified perils or "all risks".

Machinery Breakdown Insurance covering loss or damage to mechanical/electrical equipment resulting from breakdown.

Third Part Liability Insurance covering legal liabilities to third parties for injury or damage resulting from operation of the project.

Local Insurance as above.

Uninsured Risks

Beyond these straightforward insurances comes the area of risks that may or may not be insured depending on the capacity of the market or the level of premiums. In general, these risks are in the category of political force majeure and may or may not be covered by ECGD, Lloyd's or MIGA. In a limited recourse financing, it is the analysis of these risks that result in the development and negotiation of a project organizational and financial structure that attempts to share risks among the parties. In larger projects in which the government is party to the project contracts (although not necessarily as an investor or guarantor), it is the government that may be asked to take a major responsibility for uninsured risks, especially if the project is of major importance to the country's development.

A major problem in organizing simple project finance in the Countries of Eastern Europe is the high cost, or the unavailability of political risk insurance. Typically, this insurance will cover confiscation, expropriation, nationalization and deprivation following non-payment of a leasing or loan installment.

5.3. Sources of Finance

As it has already been mentioned the lack of appropriate financial funds is the most important barrier to undertake energy conservation measures in the developing countries, so this means a stringent restriction of the activity of an energy consulting company, too. Basically there are three main groups of sources of finance :

- International Financing Resources
- Commercial Finance
- Export Credit Finance

To assess and evaluate the market penetration options and to set up strategies for the market development, it is crucial to be aware of all possible financial resources.

5.3 1 International Financing Resources

For improvement of the energy efficiency in the developing countries many international institutions (aid agencies, the World Bank, the European Bank for Reconstruction and other multi-lateral agencies) have direct sponsoring programmes and financial resources for the economic development of the developing countries. Many governments of the industrialized world have bilateral aid programmes possessing energy rationalization component for various countries in the Third World and brand new for the Countries of Eastern Europe, too.

Risk reduction or transfer possibilities for shareholders

SOME SHAREHOLDERS RISKS	can be REDUCED/TRANSFERRED TO:	IF SUPPORTED BY:
MARKET REVENUE		
Purchase risk including inadequate demand/price	PURCHASER	A purchase contract including adequate volume /price /payment obligations
SUPPLY/RESERVE		
Supply/reserve risk	SUPPLIER/LENDER	Consultants report / supply agreement
Short-term supply failure	INSURANCE COMPANY	Insurance cover
TECHNICAL / OPERATIONAL PERFORMANCE		
Production efficiency	LENDER	Proof that process / technology is suited, tried, proven and tested. A technical / management agreement
Specification failure	OPERATOR	Cash penalties in equip. supply contracts / performance bonds
Operational interruptions	SUPPLIER	
Force majeure	INSURANCE COMPANY	Comprehensive insurance plus cover for relevant risks, loss of profits "Hell-or-high-water" provision in off-take agreements or : - a business interruption policy; - invite suppliers to be shareholders; - an advanced profit policy.
FINANCIAL / VIABILITY RISKS		
Completion risks	INSURANCE COMPANY, CONTRACTOR	Cover for damage, third party liability, contractor track record, bank guarantees
- cost overrun;- delay / non-completion		Business interruption / loss of earnings
Foreign exchange		Forward contracts, matching of receipts and payments by currency

Risk reduction or transfer requieremens of landers

FOR THESE RISKS	LENDERS MAY REQUIRE:	THE RISK HAS BEEN ACCEPTED BY:
POLITICAL		
Licenses, authorizations. Changes in tax / tariff structure. Completion of suporting facilities	Government assurances / undertakings	Lenders as sovereign risk
SUPPLY/RESERVE		
Quality / quantity of reserve. Shortage of raw material. Non-availability.	Engineer's evaluation. Loan agreement covenants. Insurance cover.	Lenders. Insurance company.
COMPLETION		
Cost overrun. Completion to budget. Re-completion.	Financial guarantees. Completion agreement. Pre- and post-construction insurance.	The guarantors and / or shareholders. Insurance company.
MARKET/REVENUE		
Reliability of income.	Adequate payment clause.	Purchaser.
MANAGEMENT		
Performance to specification. Management.	Insurance / contractor guarantees. Management agreement with operating company.	Insurer / contractor. Operating company.
Interruption to operation.	Insurance for interruption / breakdown.	Insurer.
FINANCIAL/VIABILITY		
Shortage of working capital. Risk to loan repayments.	Working capital financing agreement. Assigments over revenue sources.	Shareholder.
FOREIGN EXCHANGE		
Mismatch in currency receipts and payments.	Forward contracts or application of reduction methods.	It depends upon methodselected.
FORCE MAJEURE		
Natural disasters.	Insurance cover. Proof of contingency finance availability.	Insurance company. Shareholders / guarantors.

5.3.1 International Financing Resources

For improvement of the energy efficiency in the developing countries many international institutions (aid agencies, the World Bank, the European Bank for Reconstruction and other multi-lateral agencies) have direct sponsoring programmes and financial resources for the economic development of the developing countries. Many governments of the industrialized world have bilateral aid programmes possessing energy rationalization component for various countries in the Third World and brand new for the Countries of Eastern Europe, too.

Generally, all these agencies operate in two distinct fields of interest to consulting firms:

A) feasibility studies for development schemes (pre-investment projects);

B) financing the implementation of development schemes whose feasibility has been established.

Whilst some agencies provide funds for both types of activities, others tend to operate mostly, and in some cases entirely, in only one of them.

When financing a feasibility study carried out by a consulting firm, an agency itself usually enters into an agreement with the consulting firm. However, the list of consulting firms invited to submit proposals for the study is usually subject to the approval of the government of the country in which the study is to be made, and the "country government" often undertakes to supply certain personnel and services (collectively known as counterpart services) which are intended to be employed on the study.

When financing the implementation of development scheme, the agency is not the employer of the consulting firm. The borrower organization engages the consultant, his selection usually being subject to the approval of the agency.

In almost every agency it is appropriate for consulting firm to be registered if they wish to be considered for projects. For example, the World Bank has a computer based system: "data on consultants" (DACON). The DACON form is available to be used by other agencies and the following are those agencies accepting registration on the DACON form: EDF, AsDB, UNDP, UNIDO, WHO ILO, KFAED, and BADEA.

The guidelines on the issue of consulting firms by the development banks and by other agencies vary. Consulting firms should apply directly to each agency and to project authorities in the respective countries to obtain thier guidelines.

The activities and procedures of international funding agencies are constantly being developed and improved, and consequently information given here may quickly become incorrect.

Because of the importance of the international funding agencies for the consulting firm, this subject-matter is more detailed elaborated in the chapter 5.

5.3.2. Commercial Finance

This is the finance offered by Commercial Banks, either foreign or domestic, or finance based on Guarantees given by commercial banks.

Although there is a lot of seeming activity by Western Banks in eastern Europe, the actual amount of Project Finance work is relatively small. Commercial bank activity in Poland, for example, is limited to 3 year loans with Bank Handlowy guarantees. Five years loans may be available for exceptional projects. Commercial banks, although past the greatest danger from Third World debt, are still burdened by past non-productive real estate loans, unwise management buy-out loans of the 1980's, and declining economies in their home countries. They tend to very cautious about the types and terms of loans undertaken in third markets.

However, if a project is properly structured, and proper feasibility studies are prepared, commercial finance may be a viable, even attractive option. An example of this will be given below.

5.3.3 Export Credit Finance

Export Credit Finance (or Export Credit Insurance) is probably the most accessible form of project finance currently available for the markets of eastern Europe. These agencies, such as SACE of Italy, COFACE of France, Hermes of Germany, ECGD of the UK or the Nordic Investment Bank of the Scandinavian countries, provide Project Guarantees to commercial lenders. Essentially, the risk of the project becomes the sovereign risk of the lending country, allowing for very low rates of interest over a relatively long-term. Under a buyer's credit arrangement for a turn key construction project, typical interest rates are LIBOR plus 0.5 - 0.75% (LIBOR is the London Interbank Offer Rate, the rate at which banks lend to each other). The term of such a loan is typically 10 years, with a three year grace period.

A fixed interest rate loan is also available, at the consensus rate for each country, typically higher than the current interest rate. The choice of currency and type of loan will depend on the specific circumstances of the project.

What is required in return by the Guarantee Agency is a sovereign guarantee of the country in which the project is being organized. This Guarantee is open to some interpretation. Hermes, for example will not accept a USSR Republic guarantee, but SACE has done so occasionally. The Nordic Investment Bank, and its subsidiary, the Nordic Environmental Finance Corporation (NEFCO) seem to be willing to accept Baltic States guarantees. Since, in most cases, these agencies are politically driven, the types of Guarantees and loans available depend on various influences besides the actual viability of the project.

5.4 Cofinancing

The present international economic environment calls for much closer association between the different sources of financing for developing countries.

An international funding agency, such as the World Bank, can provide only a small part of the external resources that their member developing countries need. So, developing countries should search for other external sources of investment finance.

Cofinancing is one of the most effective ways for the different sources of finance to collaborate.

The additional funds come from three principal sources:

- agencies or departments of governments administering bilateral development programs, and multilateral agencies such as regional development banks and funds;
- export credit agencies, which either lend directly or provide guarantees or insurance to commercial banks extending export credits; and
- commercial banks.

Lenders have found that cofinancing offers several advantages. For example, for official agencies cofinancing is an efficient way of combining professional development expertise; export credit agencies can be satisfied that their resources will be applied to well-conceived and appraised projects; and commercial lenders can be assured that loan proceeds will be used for the intended purposes. More generally, the risks attached to lending in developing countries can be reduced through cofinancing. The underlying quality of the project, as well as close supervision of project implementation, reduces the risk that the project may not earn a return. The financing of well-conceived projects helps improve the recipient countries' overall capacity to repay their external borrowings. The arrangements for association with the World Bank for example, reduce the risk that the borrower may not repay even if the project goes well.

Borrowers also find cofinancing advantageous. In particular, it gives them greater assurance that high-priority investments can be financed on the best terms available. In addition, cofinancing can improve their access to each source of funding-official, export credit, and commercial.

Official Lenders

The two distinctive characteristics of official lenders (such as the Asian Development Bank, the African Development Bank, the United States Agency for International Development, the Federal Republic of Germany's Kreditanstalt fr Wiederaufbau, and Japan's Overseas Economic Cooperation Fund) are that they were established to give priority to development objectives, and that they provide financing on concessionary terms, or, as in the case of the multilateral institutions, on market-related as well as concessionary terms. Many poorer developing countries cannot b rrow on commercial or market-related terms. They, therefore, turn to the official agencies - for help in putting together a financial package on appropriate terms.

Bilateral official agencies work within budget ceilings fixed by their governments, and multilateral agencies work within the constraint of the size of their capital bases provided by their government shareholders. As a result, financing from a combination of official lenders may not increase the total flow of finance to the developing countries. Nevertheless, such association is highly desirable for a number of reasons:

- Many investments are too large to be carried out by any one agency.
- The channeling of flows to the poorest countries most in need of concessionary finance is encouraged.

- Agreement on the financing of investments with the highest priority is facilitated.
- Association provides a practical opportunity for official lenders to consult and exchange views on all aspects of development.

Official colenders have found it important to work closely with borrowers in the early stages of project preparation and appraisal in order to establish early on whether there is a joint interest in combining forces, as well as to decide at an early point how functions are to be shared in carrying forward the financing. The practice of working together continues while the project is being implemented and enables both parties to identify what corrective action should be taken if adjustments are needed in the project. Early cooperation between official lenders is particularly important because:

- Potential financers are able to make their decisions to lend on the basis of their own broader sectorial and country priorities, rather than in response to a last-minute "gap" in a financing plan.
- The borrower and potential colenders are given an opportunity to discuss the borrower's overall investment priorities; as a result, lending decisions by individual agencies are not taken in isolation, but are made against the broader background of borrower's investment priorities.
- The design of the project, in particular the possible source of the goods and services required, can be closely meshed with prospective financing arrangements.

Export Credit Institutions

Most industrialized countries have established national agencies such as the United States Export-Import Bank, the Export-Import Bank of Japan, the United Kingdom's Export Credit Guarantee Department (ECGD), or France's Compagnie Franaise d'Assurance pour le Commerce Extrieur (COFACE) to encourage the financing of the nation's exports. Sometimes, the agencies provide the needed finance directly themselves; in other cases, they provide insurance or guarantees under which commercial lenders provide finance for exports.

The number of projects financed together by the International funding agencies and export credit agencies is still limited. However, from the borrower's point of view, this kind of financing is well suited for projects since it provides longer maturities appropriate for such investments. Further, this type of financing is more readily available than official assistance and, in many cases, export credit guarantees are necessary to encourage commercial bank lending.

An effective association between the International funding agencies and an export credit agency requires the two to exchange information at an early stage of the project cycle. This is because an export credit agency needs to know whether a national supplier is likely to be involved in providing goods and services for the project. Early information on the type of equipment that may be required enables the agency in turn to express to the International funding agencies and the borrower its interest in cofinancing. It thus facilitates the preparation of the financing plan.

In arranging a financing plan involving export credit, the borrower and the International funding agencies must package the items of equipment so that as many packages as possible are eligible for export credit financing. The items being financed by the International funding

agencies itself under its own procurement procedures must be arranged in relation to these other packages so as to ensure that the borrower gets the most advantageous overall financing.

The International funding agencies continuing presence in implementing the entire project, together with the assurance that the project itself has met high standards of appraisal, has encouraged some export credit agencies to lend in association with the international funding agencies more readily than might otherwise be the case. From the borrower's point of view, therefore, association between the International funding agencies and export credit agencies enhances the prospects of additional finance. An equally important point for the borrower is that cofinancing can help ensure that export credit offers are used productively and for suitable equipment.

Private Sources

Cofinancing with private sources refers to cofinancing with commercial banks, most of which are privately owned.

A commercial bank loan that becomes part of a financial package for an investment together with a International funding agencies loan (and sometimes with export credit financing) is arranged on normal commercial terms. Therefore, most of the poorer developing countries are not able to look to this source of financing. Nevertheless, until the recent uncertainties in capital movements, commercial lending was the fastest growing source of funding for many developing countries.

There are two main reasons why commercial lenders can find association with the International funding agency attractive. First, the International funding agency has a long-established expertise in ensuring that loans are employed for productive purposes and in supervising the end use of loan proceeds. Secondly, the International funding agency is an important source of information on the development policies and prospects of developing countries, and association with the International funding agency can influence the perception of country economic risk. In addition, a commercial lender may be attracted to a particular cofinancing opportunity for more specific reasons:

- A domestic client may be involved in the investment as a supplier of goods and services.
- A lender may wish to establish or foster a client relationship with a particular borrower.
- Involvement may supplement a commercial bank's broader international strategy.

INTERNATIONAL FUNDING AGENCIES

P. Berlug, ENCONET International,
Zagreb, Croatia

INTERNATIONAL FUNDING AGENCIES

[illegible]

[illegible]

6.1 Generally

In this section some of the principal international funding agencies from which opportunities for consulting firms are likely to arise, will be presented.

Energy and environmental issues are to a large extent international problems. So, markets for energy projects and consulting services are international. It is therefore not surprising that international organizations are very active in these areas. A number of projects concerning energy planning in developing countries is carried out within the organization of UN. It is of vital interest to a consulting firm to be familiar with agencies from which business opportunities arise.

Generally international funding agencies operate in two distinct fields of interest to firms of consulting engineers:

A) feasibility studies for development schemes (pre-investment projects);

B) financing the implementation of development schemes whose feasibility has been established.

Accordingly we may make the following list of international agencies:

A) UN Agencies concerned with financing of Feasibility Studies:

- United Nations Development Programme

United Nations Development Programme - Office for Projects Execution

United Nations Industrial Development Organization

United Nations Department of Technical Co-operation for Development

United Nations Environment Programme

B) Funding Agencies which are responsible for UNDP Pre-investment Studies and also provide finance for capital development schemes

- World Bank (International Bank for Reconstruction & Development: International Development Association: International Finance Corporation)
- Inter-American Development Bank
- Asian Development Bank
- African Development Bank

C) Funding Agencies which are responsible for Pre-Investment Studies and also provide finance for capital development schemes

- European Development Fund
- Kuwait Fund for Arab Economic Development
- Arab Fund for Economic & Social Development
- Arab Bank for Economic Development in Africa
- Abu Dhabi Fund for Arab Economic Development
- Arab Authority for Agricultural Investment & Development
- Saudi Fund for Development
- Islamic Development Bank
- Caribbean Development Bank
- Central American Bank for Economic Integration
- The OPEC Fund for International Development

Whilst some agencies provide funds for both types of activities, others tend to operate mostly, and in some cases entirely, in only one of them.

The United Nations Development Programme (UNDP) for example does not provide funds for implementation of schemes; it does, however, arrange for a large number of feasibility studies (which sometimes include pilot schemes) to be carried out. This is usually done by providing funds to one of the United Nations "Executing Agencies", but some studies are handled by its own Office for Projects Execution (OPE).

The International Bank for Reconstruction and Development (IBRD or "World Bank") on the other hand, concerns itself principally with financing the implementation of capital development schemes. As part of such operations feasibility studies are often financed, and in addition, the Bank occasionally arranges feasibility studies and technical assistance as an Executing Agency for UNDP.

6.2 UNDP

6.2.1 General information

The United Nations Development Programme (UNDP) works with 150 governments and 35 international agencies to promote higher standards of living and faster economic growth throughout the developing areas of the world.

UNDP is providing financial and technical support to projects in agriculture, industry, education, power production, transport, communication, public administration, health, housing, trade and related fields with approximately 55% of assistance devoted to countries where per capita gross national product is under $200.

Project work covers five main fields:

- Surveying and assessing natural resources; industrial, commercial and export potentials and other development assets.
- Stimulating capital investments to help realize these possibilities.
- Training in vocational and professional skills.
- Transferring appropriate technologies and stimulating the growth of local technological capabilities.
- Economic and social planning.

Most projects are designed to be "self continuing", with national personnel taking over as UNDP support phases out. About 60% of the costs is furnished by the recipient countries through provision of national personnel, project buildings and facilities, and locally available supplies and services. The remaining 40% is financed by UNDP whose resources come from voluntary contributions by virtually every member of the UN or its affiliated Agencies.

UNDP maintains Country Offices in some 114 developing nations, headed by Resident Representatives to whom much of the responsibility for Programme operations has been delegated.

UNDP assistance is integrated into overall national or regional development efforts and almost all of its projects are carried out by the United Nations itself or one of the participating and executing agencies within the United Nations System.

The UNDP executes a limited number of projects directly, as do certain recipient governments. Headquartered in New York, The UNDP has two organizational units directly involved in procurement:

A) Office for Projects Execution (OPE), and

B) Division for Administrative and Management Services (DAMS).

Ope is entrusted with those projects which do not fall directly within the field of competence of any particular agency: inter-disciplinary and multi-purpose projects involving two or more agencies or specialized or advanced technology: regional or physical planning projects

requiring general management or special direction; and selected projects which governments wish UNDP to implement directly. Consulting service requirements cover full range offered from implementation of development projects leading to infrastructure construction and improvement.

6.2.2 Opportunities Arising from UNDP Financed Projects

Even large scale UNDP-assisted projects are relatively small,usually averaging $ 1 million to $ 1.5 million. But these projects often generate heavy capital investment totaling tens to hundreds of millions of dollars.

6.2.3 How Projects Originate

The process begins when the level of technical assistance grants over a five-year period is estimated for a developing country. This estimate is known as the "Indicative Planning Figure" (IPF). The recipient government then draws up its "Country Programme" reflecting priority development objectives for the available funds.

The Executing Agency or the United Nations organization designated to implement the project is decided upon by the recipient country (the appropriate governmental organization) and the funding organization jointly on the basis of established competence and functional areas of the United Nations executing agency concerned. In some exceptional cases, execution and implementation may be carried out by the funding organization (UNDP) directly: if the UNDP and the recipient Government decide that the project is multy-disciplinary (more than one potential implementing agency) or contains top-level technology not available within a given agency. Prior to actual implementation, a project's feasibility is assessed in terms of economics, appropriate technology, manpower and available funding. When a project reaches the approved stage, the executing agency initiates procurement.

6.2.4 Advance Notices on UNDP-Financed Business Opportunities

Timely dissemination of advance information on business opportunities is a prime concern of the United Nations Development Programme. A primary source of information on UNDP-financed business opportunities is the Development Forum / Business Edition (DFBE) published 24 times a year by the United Nations Division for Economic and Social Information / Department of Public Information (DESI/DPI). This periodical provides information on business opportunities on a global scale based upon inputs furnished by the UNDP, the Executing and Specialized Agencies, the World Bank, the Regional Development Banks and some bi-lateral development programmes.

6.2.5 Selection Process

Information concerning the selection process should be obtained from the various executing agencies. The following paragraph applies only to the selection process applied by UNDP/OPE.

A qualified consultant is often retained for a short-term mission to the project country, accompanied by the Project Management Officer as necessary, to asses the needed technical

requirements to attain the objectives desired. Detailed Terms of Reference specifying all technical and administrative requirements are then prepared, in consultation with the government, and all pertinent documentation is then sent to the firms invited to submit separate technical and price proposals.

To ensure that all qualified firms are given the opportunity to be short listed, considerations other than technical competence are also reviewed. These include as far as possible, equitable geographical distribution and past performance records as well as national preferences of the host country.

OPE which has a data base of firms, refers to other rosters as necessary, and is also associated with the World Bank (DACON) registration system.

The proposals are evaluated usually on a weighted point system covering such items as firm reputation, international and regional experience, approach and work plan, methodology, personnel and project manageability and cohesion.

6.2.6 Contract Awards

Following evaluation and rating for firms, a written and oral presentation is made to the UNDP Contracts Committee requesting its advice on OPE's recommendation to enter negotiations with the selected firm. The firms or organizations on the short list must normally be cleared by the recipient government.

After satisfactory negotiations and all particulars and administrative arrangements have been agreed, a contract is signed between OPE and the selected firm.

6.3 OPE - United Nations Development Programme - Office for Projects Execution

6.3.1 Fields of Activity

Projects which do not fall directly within the field of competence of any particular agency: inter-disciplinary and multi-purpose projects involving two or more agencies; specialized or advanced technology; regional or physical planning projects requiring general management or special direction; selected projects which governments might wish UNDP to implement directly.

Consulting service requirements cover the full range offered from implementation of development projects leading to infrastructure construction and improvement.

6.3.2 Selection Procedure

Virtually all technical assistance projects are implementing through subcontractors with consulting firms. The computerized consultant rosters of the World Bank are utilized as detailed back-up data. OPE maintains its own roster of consultants and has a brief form for this purpose. The following is the normal pattern of selection procedure:

A) OPE requests informal expressions of interest from a selected short list of five to seven firms, which the recipient governments approve. Those who reply in the affirmative find themselves on the official short list. If any negative replies to the original inquiry are received, other firms are consulted until the required number of firms is obtained. Each firm is then provided with terms of reference, budget available and names of competitors.

B) Firms are requested to submit technical proposals and prices in separate envelopes.

C) The technical proposals are ranked by OPE on the following points basis which varies depending on the nature and substance of the projects:

- 50% for the team (15% for the team leader),

- 10% for the firm,

- 40% for the method of approaching the task.

D) The most acceptable technical offer is followed up by examining cost with the firm concerned. A decision is normally made within ten days of submission of offers.

E) If requested, OPE may notify unsuccessful firms why their offers were rejected.

5.4 UNIDO - United Nations Industrial Development Organization

5.4.1 Fields of Activity

To promote and accelerate the industrialization of the developing countries through general surveys and studies, project identification, preparation, evaluation, design and implementation, manufacturing technology, management services, establishment of pilot plants and industrial estates, maintenance and repair, industrial processing plants.

UNIDO provides experts, equipment and fellowships to developing countries on project designed in consultation with the developing country or countries concerned. The funds to support these project come from voluntary contributions by Member States either directly to the UNIDO Industrial Development Fund, or to UNIDO in the form of trust funds which were established for specific purposes, or indirectly in the form of voluntary contributions to the United Nations Development Programme.

UNIDO projects embrace four main elements: experts to assist and advise; services of consulting firms for work in the establishment of industrial undertakings, fellowships, single or in groups, as a means of developing local expertise; and assistance in the equipment of testing, development and pilot plant facilities.

UNIDO maintains Investment Promotion Service (IPS) Offices to facilitate contracts between businessmen and Governments of the developing countries and their counterparts in industry and financial centers in the industrialized world.

UNIDO's role as catalyst is carried out through investment promotion meetings and by helping developing countries prepare project proposals which could be presented at the meeting. UNIDO invites potential investors to come to the meetings and works to arrange a series of discussions between those with projects and those looking for projects.

Finding appropriate resources to make a project a reality is the main thrust of the programme's services. According to the nature of the project, required resources may vary including joint venture partnerships, direct investments transfer of technology, management expertise or marketing agreements.

UNIDO's Investment Promotion Resources Information System (INPRIS) matches entrepreneurs with potential investors. The international computerized system consists of four data banks: the project file lists current project opportunities representing all branches of manufacturing and industrial services; the investor file lists offers of participation from private and public enterprises worldwide; the bank file contains information on international, regional and national development financial institutions; and the institutions file is a directory of government ministries, development corporations, chambers of commerce, manufacturer's associations and other institutions.

A vital promotional activity of UNIDO is the System of Consultations, a forum that brings together representatives of Governments, industry and labor unions to exchange information on the prospects of a particular industrial sector. The System of Consultations specifically seeks measures to deal with industrialization problems in a given sector from policy, economic, financial, social and technical points of view. Major sectors include building materials, capital goods, fertilizers, food processing, iron and steel, petrochemicals, pharmaceuticals, and wood products. The related topics of training and industrial manpower and industrial financing are also covered.

Such consultations seek to arrive at recommendations and conclusions for action which could be taken to establish new productive facilities in developing countries in these sectors. The System of Consultations provides an opportunity for all countries interested in a particular industry and people in the countries - from government, private sector and labor - to get together to talk about the problems in that particular sector - in our case in the energy sector - to evaluate the long term requirements and outlook.

Such requirements might include the distribution of new plant capacity, the possibilities and prospects for establishing a new production unit in developing countries, and the problems that need to be overcome to have those industries established. The consultations increase understanding of the problems and have identified opportunities for new investment in developing countries, opportunities for expanded technical cooperation activities, and transfer of technology and information.

UNIDO assists developing countries to identify and quantify their need for people with various levels of skills, the training requirements this implies, and to draw up appropriate policies and organize specialized programs, through group training fellowships and study tours.

UNIDO conducts a series of in-plant group training programmes for groups of engineers, managers, and other senior technical personnel, covering virtually every branch of industry

that is important to developing countries. This form of training helps to bridge the gap between the specific requirements of industry and the theoretical knowledge participants acquire through studies. Most fellowships and study tours are project oriented. UNIDO also seeks to place people in suitable industrial training facilities in developing countries, an effort that helps promote closer technical and economic co-operation among developing countries.

Technical assistance activities are financed mainly by the United Nations Development Programme (UNDP), for which UNIDO acts as an executing agency. The Industrial Development Fund (IDF) was established to supplement those funds provided by UNDP. As the chief voluntary fund of UNIDO, IDF can receive contributions from Governments, inter- and non-governmental organizations and other non-governmental sources.

Distinct from conventional sources of development finance, IDF offers a unique degree of flexibility. It undertakes industrial projects of a technically innovative, non-traditional nature, which other funding agencies are reluctant to support due to their "high-risk" nature. These pilot projects usually are of global relevance or are oriented towards regional and interregional cooperation. Thus the multiplier effect of IDF projects is aimed at maximizing modest resources by benefiting as many developing countries as possible.

6.4.2 Subcontracting Services

Registration is based on a questionnaire "UNIDO Roster of Industrial Consulting Organizations". Purchase and Contract Service (PAC) provides the necessary registration forms and all relevant information and instructions free of charge upon request. The data submitted is incorporated in a roster from which invite lists are compiled. Expressions of interest in specific project are maintained in a special documentation file. Prior registration and expressions of interest are prime elements in the selection for invitation of contract proposals. The invitee lists usually comprise five to ten organizations considered best qualified, due consideration being given to geographical balance and utilizing of financial resources. Practice is to invite costed proposals which indicate man-month costs and direct expenses separately. Occasionally contractors may be requested to provide expertise under inclusive arrangements. Proposals are reviewed by the substantive section concerned and PAC. Contracts are awarded on the basis of the lowest acceptable proposals, the primary factor being technical acceptability.

6.5 The World Bank

6.5.1 Fields of Activity

The World Bank is a group of three institutions,

- the International Bank for Reconstruction and Development (IBRD)
- the International Development Association (IDA), and
- the International Finance Corporation (IFC).

It is owned by the governments of 149 countries. It is the largest source of finance for development projects requiring the services of consulting engineers. The Bank provides financing for projects in many economic sections - transport, industry, mining, energy, agriculture, water supply and sewerage, urban development, education, population, health and

nutrition and technical assistance. It also serves, on occasion, as executing agency for projects financed by the United Nations Development Programme (UNDP) and other UN agencies.

6.5.2 Selection Procedure

The selection of consulting firms contracted under Bank-assisted projects is usually done on the basis of proposals submitted by short-listed companies. In the great majority of cases (80-90%), short lists are prepared by the borrowing country. The Bank assists in the preparation of short lists in remaining cases, but only if the borrower is unable to do so itself. On occasion, the selection process, from short-listing to actual contracting of consultants, is done directly by the Bank - when it acts as executing agency for another donor, e.g. for UNDP and other UN agencies, or when it hires consultants for its own preparatory, supervision or sectorial work.

The Bank maintains a register of "Data on Consulting Firms" (DACON) which contains key information on about 4,000 firms. It uses the register to review or prepare short lists. Although it is advantageous for consulting firms, primarily for information purposes, to be registered with DACON, it is neither necessary nor sufficient to do this in order to be included in a particular short list. Should a borrower suggest a firm not registered with DACON for a short list, The Bank will simply request from the borrower the information necessary to ascertain whether the firm is qualified for the proposed assignments. On the other hand, the mere registration with DACON is not, in itself, sufficient evidence that a firm is qualified to do particular job.

While selection of consultants is primarily the prerogative and responsibility of the Bank's borrowers, the Bank participates in many stages of this process. Specifically, it reviews and approves the composition of short lists, the selection procedures to be used, the terms of reference, the letter of invitation and the contract to be used. The Bank also assures itself that the entire selection process is followed correctly.

6.6 International Agencies & Energy Conservation

As it has already been mentioned many international institutions have direct sponsoring programmes, and financial resources for the improvement of energy efficiency in the developing countries. Moreover, many governments of the industrialized world have bilateral aid programmes possessing energy rationalization component for various countries in the Third World and brand new for the Countries of Eastern Europe, too. Some examples will be presented on the following pages.

The World Bank as a UN specialized agency discovered early the investment possibilities given by energy rationalization in the developing countries. The Bank's lending to improve energy efficiency and its preparation of energy conservation projects have been (and are) increasing markedly, a number of structural adjustment loans have addressed the need for energy conservation, with emphasis on policy making issues such as improved pricing policies and energy audits. Industrial energy audits have identified a number of large industrial plants where fuel savings of 20 percent and more are possible with relatively modest investments having payback periods of less than one year. A number of loans have been made and are in preparation

for modifying existing processes and for converting to cheaper fuels in energy intensive plants. Technical assistance has been provided for energy audits and institutional strengthening for energy conservation in various countries.

The most important energy conservation related project of the World Bank is the Energy Sector Management Assistance Program (ESMAP), which was launched jointly by the World Bank and the United Nations Development Programme (UNDP) in 1983 to complement the Energy Assessment Program which has been established three years earlier. The assessment program was designed to identify the most serious energy problems facing some 70 developing countries and to propose remedial action. ESMAP was conceived in, in part, as a preinvestment facility to help implement recommendations made during the course of assessments.

Today, ESMAP is carrying out energy related preinvestment and prefeasibility activities in about 60 countries and is providing a wide range of institutional and policy advice. The program plays a significant role in the overall international effort to provide technical assistance to the energy sectors of developing countries. It attempts to strengthen the impact of bilateral and multilateral resources and private sector investment. The findings and recommendations emerging from ESMAP country activities provide governments, donors and potential investors with the information needed to identify economically and environmentally sound energy projects and to accelerate their preparation and implementation.

The program's operational activities are managed by three units within the Energy Strategy, Management and Assessment Division of the Industry and Energy Department at the World Bank. These are the Energy Efficiency and Strategy Unit, the Household and Renewable Energy Unit, and the recently established Natural Gas Development Unit.

The Energy Efficiency and Strategy Unit is engaged in energy assessments, energy sector strategy development, strengthening the management of the sector, efficiency improvements in energy supply, and energy use, training, and research.

A small group within the Energy Strategy, Management and Assessment Division also provides central services to the program such as budgeting, coordinating donor relations, and public relations.

UNDP's Division for Global and Interregional Programmes jointly manages ESMAP in collaboration with program colleagues in the Bank. The UNDP pays particular attention to the scope and direction of ESMAP work, the undertaking of new initiatives, financial management, and donor relations.

UNDP resident representatives play an important role in the conduct of ESMAP activities by providing suggestions, support and advice to missions, facilitating contacts within recipient countries, and extending financial support through IPFs (Indicative Planning Figures).

Energy efficiency has been at the heart of ESMAP's mandate since the program's inception. The environmental imperative calls for an intensification of existing energy efficiency activities and the extension of efficiency work into new areas.

Concerning the range of ESMAP energy efficiency activities, the following activities are undertaken:

- Advice to governments on the priorities and strategic direction of energy efficiency programs would be given in energy assessments and energy strategy studies.

- In countries where an overall energy assessment is not called for, assistance in preparing an overall efficiency strategy would be provided through energy efficiency assessments which would inform decision makers of the need for energy efficiency initiatives, help set priorities in terms of energy consuming sectors and activities, prepare an energy efficiency program, and help define the institutional framework needed for successful program implementation.

- For particular sectors, ESMAP would assist in the preparation of sector efficiency programs. More than 20 activities of this type have already been carried out in the power sector, and similar activities have been performed recently for the industrial sector (e.g. Ghana), for modern buildings (e.g. Jamaica), and in the household sector (e.g. Niger, Senegal).

- ESMAP has already carried out preinvestment work for energy efficiency programs in the industrial sector, both in large-scale industries, e.g. in Ghana, Senegal and Syria, and in small industries whose energy use is an important component of production, e.g. Uganda. This work has helped focus on high priority activities, contributed economic and financial analysis, assisted in communicating results to governments, and helped promote follow-up. This work should be extended to other fields such as energy audits of buildings to support retrofits, measures to improve appliance efficiency through labelling and technical assistance to manufacturers, and possibly the transport sector.

- Although training should not duplicate what is provided by other assistance agencies, training in energy efficiency is already embodied in industrial sector activities in Tanzania and Ghana, as well as several new power efficiency activities. Proposals are being prepared for other country level and regional training activities in energy efficiency ESMAP energy efficiency activities should aim toward developing local capabilities in, for example, energy auditing. Without effective, trained national personnel, energy efficiency programs are neither likely to be sustained nor reach beyond a small number of enterprises.

Looking at the content of ESMAP activities designed for improving the efficiency of energy production and use several priority areas exist which, inter alia, include:

- evaluation of the policy environment for energy efficiency. This involves not only measures within the energy sector such as energy pricing and land use but also seemingly unrelated policies which affect the functioning of markets and the system of incentives facing energy consumers and producers;

- improving the awareness of governments, trade and professional associations, and consumers to the benefits of efficient energy production and use;

- designing minimum technical standards, fiscal incentives and other administrative policy instruments to achieve energy savings when the system of incentives (e.g. energy prices) is

distorted and where such distortions cannot be removed directly (e.g. energy efficient building codes);

- preparing new ways to finance energy efficiency through, for example, technical assistance to local banks, creation of third party financial institutions (e.g. energy service companies), and the provision of consumer credit;

- carrying out prefeasibility studies of operating improvements, retrofits, and process changes that improve energy efficiency; and

- defining the role and strengthening institutions responsible for energy efficiency.

In many countries international organizations - both governmental and non-governmental - are more active in encouraging energy conservation. These organization include the development banks, both global and regional aid agencies, but also include specific organizations, such as the International Institute for Energy Conservation, based in the United States which was formed to facilitate the needed transfer of knowledge on energy efficiency from the industrialized world to the Third World.

An other agency the United States Agency for International Development (USAID) has also been providing energy conservation assistance to developing countries since 1979. Since then: USAID has also provided energy conservation technical and financial assistance, training and information services to more than 30 developing countries covering all regions of the world. Although the major emphasis of USAID's energy conservation program has been to provide direct, country-specific assistance, USAID also conducts non-country specific analysis and applied research on major energy conservation issues and problems, such as innovative financing, private power, load management, training needs and barriers to energy conservation investment.

The goal of USAID's energy conservation program is to both develop the institutional capabilities through energy audits and training, and averseness needed to identify and implement energy conservation measures and to ensure that those measures are actually implemented.

Latin-America and Asia/Pacific are two regions which have been very active. Both of these regions have had a variety of energy related regional organizations, most of them for more than a decade: some specifically for energy and some where energy is only one component, some that is policy oriented and some which are largely technical. These are:

- Latin-American Energy Organization (OLADE) is a regional organization, which aims to serve as a focal point for the development of Latin-American energy cooperation. In 1987 the participating governments gave strong support to the organization and stressed the need to promote the active presence of OLADE at the international level. It has been stated that the priorities for the future would be: energy planning, energy balances, rational use of energy, new and renewable sources of energy, technical commercial exchange in the regional energy sector, and exchange of experiences in the area of energy financing.

- Economic and Social Commission for Asia and the Pacific (ESCAP) is the largest regional organization in the Asia Pacific, which is headquartered in Bangkok, Thailand. It has 31 regional member countries comprising 28 developing countries and three developed countries in the region, namely Australia, Japan and New Zealand, and other developed ones: France, the Netherlands, the United Kingdom and the United States. ESCAP has been taking an active role in the region's energy development and cooperation. The main features of ESCAP's approach to energy include a programme made up of three elements: energy assessment and planning; accelerated development and use of new and renewable sources of energy; and integrated investigation, development, conservation and efficient use of overall energy, with emphasis on conventional sources of energy. Parts of this programme represent technical cooperation projects using extra budgetary resources provided by the UNDP, the governments of Japan and Australia and others. Some of these regional cooperation projects such as the Regional Energy Development Programme (REDP) are for the developing countries in the region with the long term objective to assist participating countries in the areas of planning and management of energy programmes, the efficient use of energy and the development of both conventional energy and new and renewable sources of energy. REDP and PEDP are basicly funded by UNDP and implemented in collaboration with other UN organizations such as UNIDO, FAO, UNESCO and the Asian Development Bank.
- The Asian Development Bank (ADB) itself attaches high priority to the effective development of energy facilities as well as to the planning and policy making for efficient management of the energy sector. The ADB's loan assistance for the energy sector projects adds up to 5 BUSD and accounts for about one quarter of its total assistance to its developing member countries.

In 1990 ECE launched a major programme to reduce the efficiency gap between member states (project "Energy Efficiency 2000"), in addition to its existing programmes on the interconnection of gas and electricity networks in Europe, the facilitation of institutional change in the coal industry, and the provision of updated data on projected energy developments in the economies in transition.

The Pentagonal group of countries (Austria, Czechoslovakia, Hungary, Italy, Yugoslavia) adopted an energy programme emphasizing co-operation in the interconnection of oil, gas and electricity grids among its members.

All these examples confirm the great volume and variety of business opportunities for an energy consulting company.

MANAGEMENT OF CONSULTING COMPANY

Z. Morvaj, ENCONET International,

Zagreb, Croatia

Proceedings of the
THE WORKSHOP ON CONSULTING SERVICES IN ENERGY CONSERVATION
Zagreb, Yugoslavia, May 13 - 17, 1991

MANAGEMENT OF CONSULTING COMPANY

[illegible]

7.1 Budget

In the simplest form, profit is the difference between revenues and costs. From this statement it is obvious that costs are predictable and controllable. Conversely, if either revenues or costs are unpredictable or uncontrollable, then profits are also unpredictable.

Usually, the management of a consulting company is continuously faced with apparent conflicts for their time. Many managers perceive that the time they expend managing their business diverts from the time that should be expended on work for their clients. However, a significant amount of time, if properly expended, can serve the dual purpose of managing the business and serving the clients.

The fact base upon which the decisions are made is usually composed of a "trivial many" facts which have an insignificant effect upon results and a "significant few" facts which have a significant impact on results. So, it is essential to distinguish the significant from the trivial, to identify the elements of a consulting company's budget and control system which are worthy of time to produce significant results for both your business and your client's projects.

A measure of the firm's ability to budget and control its financial results is the difference between the planned results (i.e., the budget) and the actual results. It should be noted here that even when the actual results are exceptionally favourable (i.e., when actual profit exceeds significantly the profit plan) we may conclude that the budget was week. Furthermore, we may conclude that the profit results as compared to budget are indicative of a management which

may not have control of its business. The results could have produced a substantial loss as readily as it produced the substantially more favourable profit results.

Manager in the consulting company should spend a major amount of his management time predicting and controlling revenues because costs are much more predictable and controllable than revenues in a consulting company.

The consulting company is faced with a business situation which is unlike most firms in manufacturing, construction, wholesaling, and retailing. In most non-service fields, costs can be clearly defined as either fixed or variable, and total costs will vary significantly according to the amount of work or the volume of sales. Variable or production-related costs in these other business usually represent about 70 % of the total cost of doing business, and should sales fall off, cost can be cut proportionately.

The consulting company, on the other hand, is faced with high fixed "capability" costs. It must maintain a competent professional staff, capable of handling whatever assignments are acquired. The consulting company can seldom cut expenses back to any significant extent during brief periods of low activity, without seriously impairing its readiness to serve and its performance capabilities. Neither can additional capacity be obtained on short notice should busy periods be suddenly encountered. If this is so, then the consulting company's costs are primarily time-related rather than production-related, and total costs will stay at a relatively uniform rate of incurrence over extended time periods, regardless of sales volume. Of course that many consulting company are faced with some variable costs. However, from a business perspective, the variable costs - which are commonly referred to as other direct costs (ODC), are project-related and are readily identified. It is important to distinguish between revenues and costs accrued through labour and revenue and costs accrued through other direct costs.

Furthermore, unlike manufacturing, wholesale and retail business, the consulting company has no opportunity to inventory its product during low volume periods for future sales during high volume periods.

The opportunities for optimizing profit lie in the company's ability to maximize production continuously over the time. The optimization of production lies in the company's ability to capture new adequately priced contracts and control the completion of the contracts according to the plan.

Revenue management can be subdivided into three business functions, namely:

- Marketing and sales - that is the company's ability to capture new contracts.
- Finance - that is the company's ability to adequately cost and price its work.
- Production - that is the company's ability to execute its work efficiently and effectively.

In the section 6.5 one specific function is focused - production. Namely, the project control offers significant opportunities for a consulting company to manage its revenue and, in turn, budget and control its profitability.

A revenue plan should be prepared, monitored, and controlled for each project, The plan should be routinely developed as a part of the project control activity. The functions of the plan are three-fold:

1. It is a measurement of the completion of commitments to the client;

2. It provides a piece of the revenue plan; and

3. It can be used as the basis for cash-flow projections, both for the client and for revenues to the consulting company.

7.2 Finances

If we assume the primary purpose of a consulting company to be the provision of high quality independent professional services, then we may see that financial manager in a consulting company is faced with other circumstances than his colleague in an industrial firm, for instance, where the straightforward objective of "maximization of profit" will largely determine the responsibility of both production and financial managers.

In the consulting company it is the engineer who is primarily concerned with the firm's objective, whereas the financial manager plays more of a supporting role in regard to the provision of services. For this reason, the position of the financial manager in a consulting company is less dominant than in the average industrial company.

However, the idea that profit is essential to his continued existence is certainly familiar to the consulting engineer. Everybody will agree that in every consulting company the following conditions have to be met:

A) continuity - ensuring that the company continues to exist for a longer period of time;

B) stability - day by day protection of the firm from events which might give rise to uncertainty amongst personnel or clients;

C) flexibility - ensuring that sufficient reserves are created to enable the firm to react effectively to unforeseen set-backs or opportunities.

How the management of working capital can help the firm in meeting these three conditions?

Established company strategy and its translation into annual planes leads to the drawing up of budgets. These form a coherent system, which is strongly department orientated on the one hand and project orientated on the other. The budget system reflects the company's organization and, therefore, the structure of responsibilities. Because of that delegation and decentralization are key-words in this particular field of financial control.

The control of the working capital is, however, less directly connected with what happens in all the various parts of the organization. The object of working capital management is formed by the company's capital resources and the use that is made of them.

Working capital we define as the total amount of money which is tied up in the cash-cycle at a given moment, or current assets minus current liabilities. The object of working capital management is to influence relevant factors in such a way that the volume of working capital is optimized. Of course, if the working capital becomes too large, this leads to unacceptable interest charges. However, we speak about the optimization rather than about minimization because of the disadvantages that result from a working capital that is too small; disadvantages such as clients irritated by very strict demands for early payment, or the exceeding of credit limits, and their consequences for the company's well-being.

An important external factor which underlines the absolute necessity of sound working capital management, is the rate of inflation which is significant in the most developing countries.

When we are speaking about the flexibility, it is evident that a distinctly higher current ratio than one to one is desirable. However, it seems exaggerated to apply the ratio two to one, as is often done by industrial companies. The ratio must in any case be higher if there are obvious risks among the current assets or the company wants to be prepared for certain opportunities or set-backs. A higher current ratio also facilitates obtaining additional bank credit.

Under the pressure of the financing problems consulting companies are tending more and more to demand advance payment from their clients. Moreover, credit and collection procedures, well-known in industry, are cautiously being introduced into some consulting companies.

When speaking about continuity, the engineer will be inclined to remark that it is the quality of his services which guarantees the continuity of the firm. But if this quality, however good it may be, is not translated into an acceptable degree of profitability, flexibility requirements missed.

The ratio between owner-supplied and borrowed funds, or alternatively between equity and loan capital, indicates the financial long term soundness. Under the influence of the effect of inflation on working capital, the ratio of equity to loan capital has a tendency to decrease. If we agree that profit is practically the sole source of equity for the independent company, then everybody can work out for his own company what degree of profit must be secured, after deduction of taxes and dividend payments, to achieve the same rate of growth of your equity capital as that of total capital requirement. One can afford to neglect this point for some time, but what should be avoided is that the ratio goes down so law that further acquisition of loan capital becomes difficult.

The equity ratio is another factor for which it is not possible to lay down absolute standards. The requirements will usually be lower for the consulting company than for the industrial or trading company, whose assets are exposed to much greater risks. It is also of importance whether the firm operates with many or few fixed assets.

At the end we may conclude the following:

- Key ratios can seldom be related to absolute standards or to those of other companies, although bankers tend to do just that. It is, however, very instructive to keep track of the fluctuations of the most important ratios over a longer period of time in a company, and to try to find out what is causing these movements.

- A healthy financial structure does not require ample cash reserves but good ratios.
- Ultimately, profit forms the basis of a healthy series of key ratios which in turn opens the doors to the loan capital.

Graphs can be very useful to visualize what is happening. A well known European consulting company makes use of graphs showing series of key ratios, for example:

- work in progress against production and
- accounts receivable against billings,their fluctuations being followed monthly.

7.3. Personnel

The subject of personnel management, particularly as it relates to international practice, has no rule book. If a computer breaks down we can repair it. If our business development programme becomes stagnant and ineffective we can shake it up. Yet in the area of personnel which can represent up to 75% of the cost of running a company, we have little to guide us except what too often consists of basic good judgment and lots of just plain luck.

The most successful practice is the ability to attract, maintain and motivate qualified engineering personnel. To attract qualified people is easier than to keep them. An essential part of any successful company is to maintain a loyal technically qualified staff with a high morale and this is never an easy task.

Of course our technicians must be of a high standard and so must our secretaries. A good dedicated secretary can increase the performance of a professional by as much as 40 percent. Unfortunately engineers do not make sufficient and adequate use of secretaries and their ability.

Qualifications on the basis of appropriate education, training and/or experience, needed to perform each particular task, should be identified and appropriate records of education, training and experience should be maintained. This refers to all the personnel either full time, part time or on a contract basis.

7.4 Project Proposals

In the consulting and engineering service sector project proposals to clients are the "lifeblood" of the business. The time we spend in planning our approach to project and analyzing client's needs and interests is the most important time we will spend on the entire project.

When big projects or large amount of money are at stake, seldom does one person bear full responsibility for developing and issuing a proposal. The business teams of specialists are assembled, proposal staffing assignments are made, a proposal manager is appointed, budgets are established, and a proposal strategy is developed before a single word is ever put on paper. If one person is doing the job solo, it simply means that he has several roles in the proposal's development.

As soon as we have determined that we are going to issue a proposal for one particular project, our first action should be to call a meeting of everyone involved in the proposal effort. The purpose of the meeting is to map out a definite strategy to meet the proposal's goal, to make assignments, and to establish deadlines.

7.4.1 Staff Assignments

Producing a winning proposal, particularly a large one, involves a great deal of effort and coordination. The first assignment to be made is to put one person in charge of the entire proposal effort. That person is responsible for coordinating the efforts of all others involved in the project and making sure it is issued on time. Various other duties are assigned to appropriate people. Portions of the proposal may need to be written by some other experts, it may require review by low-experts, project staffing considerations must be addressed, and someone should be assigned to edit the report. It could be useful to assign one person to handle functions such as editing, typesetting or word processing, graphics, printing, collating, and binding.

7.4.2 Deadlines

Obviously the proposal must be issued at some point, and that end point is the beginning of the planning as far as deadlines are concerned. Start with the issue date and work backward. Make a list of all the things that must be done, and establish a date for completion of each. Make sure you allow enough time for each step, because you can be sure some deadlines will be missed along the way, and you will need to make up the time elsewhere.

It could be good to schedule meetings at key points along the way to review the progress to make sure each team member is meeting the established deadlines. Such checkpoints might include the following.

1. The end of the information gathering stage.

2. The first draft review stage. Circulate copies prior to the meeting and ask team members to be prepared to comment on the draft at the meeting.

3. The final draft review stage. Copies reviewed prior to this meeting should include suggestions and corrections made on the first draft.

If any deadlines are going to be missed that will affect the entire schedule. It could be necessary to call a special meeting of the proposal team. Everybody hates surprises when they cause problems, and getting the team together may result in a solution to the problem and getting the proposal back on schedule.

If the proposal team is relatively inexperienced in producing proposals, you may want to schedule more frequently meetings to check the progress of the effort.

7.4.3 Types of Proposals

Depending on their length and nature we may divide proposals into four basic types:

- Proposal letter
- Standardized proposals
- Short proposals
- Formal proposals

The proposal letter

The proposal letter may simply confirm and formalize an agreement reached earlier, or it may be a stand-alone proposal for a project that is neither complex nor expensive enough to warrant a larger document.

Generally a proposal letter would be no longer than three or four pages.

The standardized proposal

If the terms, conditions and activities being performed are similar, a proposal is ideal for standardization.

The standardized proposal, despite its description, usually changes slightly to accommodate minor variations on the same time. The layout, the headings, and the general elements included are the same, but the number of points under each may vary, depending on the size and scope of the project.

Standardized proposals may vary in length from very short to very long.

The short proposal

Generally fairly informal in appearance and content, short proposals differ from standardized proposals not only in length but also in that they are developed for a specific purpose and are written for such a one-time use.

The short proposal incorporates more of the elements of a formal proposal than either the letter or the standard proposal. The inclusion of a table of contents, introduction, and appendix, however, may not be necessary when the topic being discussed is relatively simple and inexpensive according to company standards.

The short proposal and all its attachments and exhibits may be up to ten pages in length.

The formal proposal

The formal proposal is longer, more comprehensive, and usually has most or all of the traditional elements associated with proposals.

The formal proposal should always be outlined before writting in order to make sure that the elements we planned to include are all there and that the amount of time and space we spend on each is in accordance with its relative importance to the entire proposal.

7.4.4 Elements of a Proposal

Covering letter

Covering letter should tell the recipient why you are sending the proposal and call his attention to key portions or otherwise identify the information that might be of interest. In some situations covering letter should also identify the next step.

Table of content.

There are no hard and fast rules about when to include a table of contents, but if the proposal is going to be ten pages or longer, it is a good practice to include one. Its purpose is not only to make it convenient for the reader to find various sections of the proposal but also to influence the reader positively by listing the elements that comprise your approach to the project.

The table of content should be neat, orderly, and descriptive. It should be the last part of the document prepared in order to make sure that it is a accurate and that the pagination is correct.

List of Tables and Illustrations

Depending on the number of illustrations, charts, graphs, tables, etc., that you use, it may be good to include a listing to help your reader find them quickly. Most readers like illustrations because they allow them to get the big picture without plowing through pages and pages of narrative.

If the proposal has only one illustration or two, we may decide not to make a list, or we may decide to incorporate the location of the illustrations or tables into the table of contents. Purists would probably frown on such a suggestion, but the intent of the proposal is to sell something - an idea or a project - and there are no purists if the proposal is successful.

Executive Summary

On any proposal team there is always one person who counsels against including an executive summary. The argument is that, if we include a summary, the recipient will not read the whole proposal. In actual fact, however, a very few persons will probably read the entire proposal. Different people may read different sections that interest them and scan the portions they consider to be of lesser importance.

The idea is to make it as easy as possible for the reader. The executive summary allows the reader to get a feel for our approach before reading the entire document and to identify the sections that he would like to know more about before making a decision about the proposal.

The benefit from including an executive summary is far greater than the risk of not including it.

The length of the summary may vary according to the situation at hand. Some proposal writers insist that it should never be more than one page in length, while others simply advise that you keep it short. General rule may be to make the summary no more than one tenth of the length of the finished document and never more than four pages long.

An executive summary should not be confused with an abstract. An abstract should be a condensed representation of the entire proposal, while an executive summary is not bound by any constraints other than to make it easy for the reader. As writer of the proposal, what you include in the executive summary is your option.

Introduction

If there is a single most important function for the introduction to perform, it is to get all the readers to the same point of departure.

In the introduction you should identify the scope of the project, outline your approach to it, and state why you believe this is the best approach. If there are problems or limitations inherent in the project, they should also be identified and commented on in the introduction. In short, the introduction tells the reader how you were thinking when you wrote the proposal so he can identify with your approach.

Text of the Proposal

The text or body of the proposal is where the win is made or lost. The information you include in the body of the proposal should be so informative and so persuasive that your reader is led to the logical conclusion that your proposal should be adopted.

To ensure success requires careful attention to the type and amount of information to include. The best guideline to follow is to make it easy for the reader.

Here you may include the information about how you plan to manage the project and present a schedule for the completion of the work. You may plan to include the users in reviewing progress of the project, if possible, and identify checkpoints where users approve the progress to date before proceeding further.

Refer your readers to the appendix for resumes of key members of the project group, which detail their expertise in the field.

In a situation where an ongoing relationship is about to be established, you may decide to include some commentary about the philosophy of the company.

In the section that deals with costs you should be realistic with your numbers. Nothing will turn off a potential client more quickly than your trying to fool him about costs.

Exhibits and Appendices

The purpose of an appendix or exhibit section of a proposal is to include information that may be related to the topic of the proposal but is too detailed, lengthy, or otherwise unwieldy to

include in the text. Examples might be resumes of project staffers, related articles or brochures, detailed technical or financial computations, technical data, or other related tables used in computing prices or fees that you included elsewhere in the proposal.

As you write the text portion of the proposal, make a list of the supporting information you used, to consider later for possible inclusion in the appendix section. If there is any doubt when you are writing the proposal as to whether a certain table should be included as a table or figure in the text or included in the appendix, put it in the back. If it was sufficiently detailed to cause you wander, it probably belongs in the appendix.

7.4.5 What to emphasize ?

To persuade the decision makers to accept project, the following should be emphasized in the project proposal:

1. Benefit to the client

The best argument for the project is that it will make or save money. In energy conservation projects, however, the cost/benefit relation is not often so apparent. The project may have a big up-front cost and long wait before savings are actually realized. In that case a truthful but optimistic picture of cost/benefit considerations should be painted. Things such as possibility for stretching energy supply, reducing energy costs, saving foreign exchange, an improvement in efficiency, a competitive advantage, or an investment in the future. etc. should be emphasized.

2. Minimal risk

If there is a potential risk, it should be addressed in the project proposal. Everything in business has a certain amount of risk, and decision makers are accustomed to taking chances. Before taking that chance, however, they want to make sure that a sensible plan is in place to deal with problems and contingencies. If you don't address the risks and tell your readers how you plan to deal with them, they can only assume that you did not plan for problems, or that you chose not to address them in the proposal. Neither alternative is as effective as meeting potential problems head-on with well thought out plan for dealing with them as they arise and checkpoints at strategic points along the way to identify them before they become series enough to impair the progress of the project.

3. Project management and skills

Even if the project is a radical departure from anything the company has ever done before, and has no appropriate references, it does not mean that the project cannot be accepted. One element of the proposal that may assure the potential client that project will be successful, and that company can manage it is the portion that deals with the people who will staff the project. If the persons assigned to manage the project have managed a similar or equally difficult project (in the present company or the previous one), it may be referred. If they haven't, emphasize skills and education they have that will aid them in this project.

4. implementation plan

In the implementation plan you may include schedules of various elements of the project, and the way of progress monitoring. If it is a big project, you may break it down into manageable pieces wit reporting and approval plan for each phase of the project.

In some cases it may be useful to illustrate the project plan in bar-chart form, in which each bar represents, in time, the beginning, duration and end of a segment of the total project. The method is simple, easily understood and makes an immediate visual impact.

Proceedings of the
THE WORKSHOP ON CONSULTING SERVICES IN ENERGY CONSERVATION
Zagreb, Yugoslavia, May 13 - 17, 1991

PROJECT MANAGEMENT

R. Šenjug, ENCONET International,
Zagreb, Croatia

Proceedings of the
THE WORKSHOP ON CONSULTING SERVICES IN ENERGY CONSERVATION
Zagreb, Yugoslavia, May 13 - 17, 1991

PROJECT MANAGEMENT

R. Senjug, ENCONET International,
Zagreb, Croatia

8.1 Project Management

Many plans and models have been prepared for activity/manhour modeling and scheduling. The most sophisticated models are referred to as CPM (Critical Path Method) and PERT (Project Evaluation and Review Technique).

Although these models, no doubt, have their place in planning and control of some work, in the most cases the work of project staff can be adequately managed and controlled with less complicated bar graphs, also known as Gantt charts. The CPM can best be utilized as an activity logic plan, but is not effective as a control tool.

The effort required to continuously revise and update the CPM is simply not cost effective. Furthermore, the activity logic cannot be clearly described. Most planning and design work is subjected to "recycling". However all "defects" mentioned above can be resolved using some of the very sophisticated software products available on market place.

Large volumes of literature have been written on project scheduling and control. An inexperienced consulting engineer may be tempted to select the more sophisticated tools for application to managing projects. It is advisable to resist this temptation and focus the valuable management time on tabular manpower planning by activity by project.

There is no doubt that project planning is an essential part of the performing business in a consulting company. It ensures that

- all client's requirements will be met;

- responsibilities, authorities and relationships of persons involved in project performance are clearly defined;
- everyone involved is aware of his responsibilities and duties;
- checkpoints at strategic points are planned;
- potential problems are identified, and will be met head on as they arise;
- each activity will be carried out under controlled conditions;
- necessary special skills and qualifications of personnel are identified and recorded;
- communication lines are defined; etc.

Each project plan should give the answers to the following questions:

- What needs to be done ?
- Who will do the tasks ?
- How long it will take ?
- How much it will cost ?

Good and clearly defined project organization, suited for each particular project if necessary, is an important prerequisite to effective implementation of quality assurance in project managing. An example of the developed procedure for project organization is shown in addition. In this example it may be seen how to identify the responsibilities and assign to all personnel who manages and performs work in a particular project.

8.2 Example : Project Management Procedure

Complex projects demand a set of structured tools and techniques for planning, monitoring, and tracking time, resources, and money, called project management.

Project management involves

- organizational issue,
- management tools, and
- project management process.

The first step in project management process is to communicate the plans and goals to those who will be involved in the project.

At this point you can establish how much control you wish to have over the project.

Of course, for a simple project a manager could plan a project in his head, and he could manage the effort merely by talking to the persons involved periodically.

For a large project appropriate organizational structure should be created, to facilitate communications and accountability among many contributors. The most important thing in every project organization is to clearly define the responsibilities, authority, and relationship of persons involved in project.

Apart from that, monitoring and reviewing a project on a regular basis have an important role in project management. The purpose of monitoring and reviewing is to ensure that any deviation from planned performance is discovered early enough to enable corrective action to be taken. Only if this is achieved can the system be described as one that provides for project control - otherwise it is merely a system for recording history.

In addition, therefore, to stating what has been achieved, the reporting system must show a forward projection to the completion of each relevant activity and indicate the corrective action being taken where there is any departure from plan, either actual or forecast.

The reporting system should be such that each level is responsible for reporting upwards on the key activities in the work-package for which each is responsible. These are based on the more detailed reports received from the level reporting to them. In this way the amount of detail is filtered at each level of management but is available if required.

QUALITY ASSURANCE PROCEDURE

PROJECT ORGANIZATION

CONTENTS

6. **PROJECT/SUBPROJECT MANAGER**

6.1 Organizational position

6.2 Staff selection

6.3 Principal assignments and activities

6.4 Required knowledge and experience

7. **PROJECT/SUBPROJECT GROUP**

7.1 Organizational position

7.2 Staff selection

7.3 Required knowledge and experience

8. **ORGANIZATIONAL SCHEME**

9. **CLOSING REGULATIONS**

1. INTRODUCTION

A project is any assignment with a clearly defined goal which has to be realized in a determined period and with limited funds. This assignment is usually a job happening only once and has a structure of certain complexity.

Every project must be organized in accordance with rules specified in this organizational regulation.

2. PROJECT ORGANIZATION

The project organization represents a special, temporary organization established in order to realize a certain project.

It implies the participation and collaboration of several persons/organizational units each of them performing the defined assignment for which the responsibility had been defined in advance.

Note: in very small projects one and the same person can perform several functions.

Organizational units and functions making the project organization are:

- the project managing team
- the link
- the consulting group
- the project/subproject manager
- the project/subproject group
- the chief of the group

3. PROJECT MANAGING TEAM

3.1 Responsibilities

The team (as a body) is placed above the Project Manager and has the following obligations:

- to decide about the beginning of the project,
- to estimate the complete project and to decide about the limits of the project during the plan elaboration and the project realization,
- to ensure that the project will be realized in accordance with the accepted quality policy,
- to decide about the termination, and to declare that the project is finished.

THE TEAM MUST NOT:

- allow the limits of the project to be decided about by anyone else except the project managing team,

- interfere with the decisions of the Project Manager being within the limits of the project (i.e. decisions about alternative technical solutions),
- allow the orders for the project plan change to be given to the members of the project group directly by the team.

3.2 Required knowledge and experience

The project managing team must have the required experience and knowledge of:

- the business policy and the quality policy of the company,
- the business policy, quality policy, plans and resources of the organization realizing the project,
- the contents and importance of the project plans,

project objects.

3.3 Structure and appointment of the members of the team

The members of the team are appointed by the manager of the company.

The project managing team should have max. 4 members and it should include:

- the manager of the company,
- 1 - 2 members appointed by the board of directors,
- the project manager.

4. LINK

4.1 Organizational position

The link is organizationally situated between:

- the non-project part of the organization, and
- the project organization.

The link is suggested by the Project Manager and is appointed by the project managing team.

4.2 Principal assignments

The principal assignments of the link are:

- the connection between the functions and the people in the organization,
- the connection, if possible, with external collaborators or other participators influenced or affected by the project,
- the connection between the project organization and persons realizing the project,
- the filing of each of the mentioned communications.

4.3 Required knowledge and experience

The link must have basic knowledge of:

- the project object (e.g. existing problems and where),
- the organization realizing the project and persons to be contacted for further information, opinions etc,
- the quality policy of the company and its own share in the realization.

4.4 Assignments from the project managing process

The link is obliged to:

- divide with chiefs of single activities and other members of the project/subproject group the blocks of activities into detailed activities,
- receive and file information about the activities description contents from the chief of activities,
- collect and analyze information about the project object relevant for project plan activities according to one's needs,
- record and file daily the work on the project.

5. CONSULTING GROUP

5.1 The consulting group is organizationally situated between:

- the non project part of the organization, and
- the project organization.

5.2 Structure and appointment

The establishing of the consulting group is not obligatory. If necessary, it is established by the project managing team from structures which are not influenced by the result of the project and are acquainted with details of the project object.

The consulting group can have max. 4-6 members.

5.3 Principal assignments

The consulting group gives opinions, suggestions, alternative solutions, ideas and advices to the Project Manager and the Project Manager consults the group when it is the question of the suggested and realized results

- of the complete project,
- of a single activity or a block of activities.

5.4 Required knowledge and experience

The consulting group must have "first-hand knowledge" of the project (its limits, properties, functions, design etc.).

6.PROJECT/SUBPROJECT MANAGER

6.1 Organizational position

The Project Manager is responsible to the project managing team for the complete project, and in a very simple case the Project Manager also manages the project group.

6.2 Staff selection

The Project Manager is selected and appointed by the project managing team and in very simple cases it is done by the manager of the company.

6.3 Principal assignments and activities

The principal assignment of the Project/Subproject Manager is to: plan,supervise, and manage the realization of the project/subproject in order to realize the goals of the project with maximum service quality and minimum engagement of resources.

Therefore it is necessary:

a) in the planning phase to:

- identify the potential problems, and
- undertake preventive actions.

b) in the project managing phase to:

- recognize the "signals of danger" and
- undertake corrective actions.

Within the limits of the project defined by the project managing team, the Project Manager is allowed to decide and undertake freely actions concerning:

additions, changes and/or cancellations of activities from the project plan, influences on the working methods, auxiliary means, technical solutions etc, substitutions of resources (in cooperation with the corresponding department of the non-project part of the organization and external collaborators), changes of terms, meeting convocations etc.

THE PROJECT MANAGER MUST:

- elaborate and hasten the complete project plan leaving to subproject managers, respectively to chiefs of activities and the project group the detailed planning,
- inform the project managing team in accordance with the plan project.

- elaborate suggestions for corrective and/or preventive actions and deliver them to the project managing team in order to make final decisions,
- suggest and select people with adequate qualifications in accordance with the quality policy of the company (e.g. skilled knowledge, communication capabilities etc.),
- give order for activities realization,
- convoke and lead meetings
- communicate with all internal participators and functions, external collaborators and managers of other projects in case of mutual events and file all the important elements from those communications,
- take care of additional education (and training) for the members of the project organization,
- create and maintain a high degree of motivation among all participators directing them to the goals,
- stimulate directly the quality of work,
- establish a library of documents related to the project,
- verify, respectively approve reports on the spent resources in the project,
- collect and record facts, effects and the like about the project management,
- identify and analyze causes and effects of raised and expected plan deviations (withdrawings).

THE PROJECT MANAGER MUST NOT:

- allow the project organization to come in the situation that notably renders more difficulty to come to the Project Manager (e.g. too occupied with meetings); a period of time during the day can be determined when he will be available,
- disturb the members of the project group at work with superfluous supervision or work interruptions for meetings,
- be too much dependent upon the project managing team,
- perform personally activities and assignments instead of others,
- repeat the work for distrust of the members of the group.

6.4Required knowledge and experience

The Project Manager must with his knowledge and experience cover all the important aspects of the project, that is:

- the business policy and the quality policy of the company,
- project objects, systems and/or processes in which the project activities are performed,
- the process (or a part of it) making the project, that is, the subject of the project plan,
- the resources that will be engaged in the project (education, experience, training, work efficiency, motivation etc),

- the theory and practice for project management.

The most important property of the Project Manager is the managing capability.

With regard to staff resources, it is important for the Project Manager to be able to:

- avoid conflicts,
- estimate capabilities of people,
- arrange activities,
- motivate the people,
- communicate with the people.

The technical competence of the Manager can be described by his experience and practice knowledge making the project, that is, by experience and knowledge of:

- the activities and an assignments and their interdependence,
- work methods and means to be used,
- contents of activities work.

The Project Manager can successfully manage the project even if he knows little or not in the least the process or a part of the process making the project. But, in that case his assignment will be much harder since:

- he must rely on opinions and the good will of others when it is the question of planning, defining reasons and effects of with-drawing, suggesting and deciding,
- the communication with the participators in the project renders more difficulties because they think of him only as an "administrator", so that he will have difficulties in detecting all dangers and potential withdrawings.

On the other hand, a too detailed knowledge of the project process is also not desirable, because it can occupy him with details which are of special interest to him.

7. PROJECT/SUBPROJECT GROUP

7.1 Organizational position

The project/subproject group is subordinated to the manager of the project/subproject. The members of the project group are performers of activities.

Within the project group various working groups can be established which are subordinate to the chief of activities and are performing activities.

7.2 Staff selection

The Project Manager proposes the number and the organization of the project group and the proposal is approved by the project managing team.

The members of the project group are selected by the Project Manager.

7.3 Required knowledge and experience

The members of the project group must:

- have the required experience and "first-hand knowledge" for performing the planned activities,
- have the basic knowledge of the complete project,
- be acquainted with the quality policy of the company and their own share in the realization.

9. CLOSING REGULATIONS

The author is obliged to give all the necessary explanations regarding the application of this organizational regulation. The organizational regulation becomes effective by the day of its promulgation.

The manager of the company is responsible for the distribution and the application of this organizational regulation.

QUALITY ASSURANCE

R. Šenjug, ENCONET International,
Zagreb, Croatia

QUALITY ASSURANCE

R. [illegible]njug, ENCONET International,
Zagreb, [illegible]

9.1 Why Quality Assurance ?

Until recently, quality assurance has been mainly applied to manufacturing. However, experience and the explosive growth of the services industry has shown that quality assurance should be implemented in delivering services as well.

9.2 Quality

Among many different definition of a quality we have chosen the following one:

QUALITY = CONFORMANCE WITH USERS' REQUIREMENTS

The emphasis is on "users'" because our Client may not actually be the ultimate "user" of our service, who will decide at the end whether the service had "quality".

9.3 Quality Assurance

As a management technique quality assurance is relatively new. It comprises various principles of good practice which are necessary to a greater or lesser degree to all kinds of businesses, and could be used:

- by one company or the Client to assess another, or
- as a basis of agreeing requirements between two contracting parties, or

- by an organisation itself to set up a more effective system of management.

Though all quality assurance activities are not necessarily financial in origin, there was enough evidence to indicate that the cost of doing business wrongly was an enormous amount. Further more the cost might not be measured in money alone but in human life and damage to the environment. And finally,

Implemented quality assurance system can be the difference between success and mediocrity in today's competitive environment.

Quality Assurance does provide a set of rules which, if followed, can provide for more effective ways of operating the business. It's not the total answer without the will and commitment of everyone in the company but it's a good first step on the road to excellence.

The emphasis in any Quality assurance system is to prevent problems from occurring.

Our clients - in both the public and private sectors - rightly want to know our capability to meet their requirements. Implemented quality assurance system is the best way of demonstrating to our clients that we are committed to quality.

In the public sector purchases are financed by public funds. The products are often complex systems of interest to all major economic, social, and political forces. The purchaser, usually a governmental agency, awards the contract on behalf of the public. The choice is always open to public criticism via media, elected politicians, various associations, and public forums.

The problem that arises is "How to identify the contractors that are capable of meeting the contract quality requirements?"

The consultant company can be on the both sides:

- purchaser side - as a governmental executive agency,
- supplier side - as a contractor.

In both cases quality assurance can be very important because :

- Working with companies that have implemented quality assurance system, Client could gain some confidence or assurance earlier in the cycle that requirements would be more likely to be met.
- Implemented quality assurance system can be the difference between success and mediocrity in today's competitive environment.

9.4 Quality Assurance System

The most important thing with quality assurance system is that management has to be serious about it. The management ought to give to it some robustness and integrity. If they for example allow certain people to make changes outside of the system to allow some requirements not to be met but don't want to know how it was done, then management is not in control, and is showing people by it's bad example that this is how they want the company to be run. At that moment, the quality policy, however gloriously written, is completely worthless.

What a manager says to his workforce may be given some attention. What he actually does really shows what he means.

Each quality assurance system should be based on:

A) Quality assurance manual as the basic document of the system, which should be in accordance with some of the international quality assurance standards;

B) Worked out, documented procedures and directions that meet the demands of the Company's Quality Assurance Manual and the relevant international quality assurance standards;

C) Insurance that the points from A) and B) are efficiently applied.

The quality assurance system should emphasize the prevention of problems without diminishing the ability for solving them when they occur.

9.4 Quality Manual

In connection with all mentioned above, the documented quality policy and quality assurance manual as a basic document demonstrate our intentions and goals.

In any kind of work that involves more than one person we have the problem of different views on the same thing. To avoid conflicts that could arise from different views on the required quality of some part of the common work, it is essential first of all to agree as exactly as possible what are the requirements.

Quality Manual enables that every person within the company has a common understanding of the business's goal and his role within this.

So the quality/quality assurance manual defines the quality/quality assurance system for a company and its policy, objectives and quality obligations. It also secures a uniform understanding of the adopted quality/quality assurance principles in all parts of the company.

Because of the important marketing value quality assurance manual may be used in all market promotion activities of the company which means it can be given to a client on demand.

An appropriate independent assessment of our quality assurance system will demonstrate that we have succeeded in our intentions, and that company is managed through effective systems which can be relied upon.

9.6 Implementation

How to translate QA requirements into good practice and common sense applications in a consulting company?

First of all, implementing a quality system in a consulting/engineering company requires the development of particular considerations to traditional industry-based quality system elements and terminology.

Furthermore development and implementation of a quality system in a consulting company require the development of special procedures adopted to this kind of business.The FIDIC's "Guidelines for the Evaluation of Consultants' Performance and other Services" may be recommended as a basis for establishing company standards.

To illustrate how quality assurance requirements can be translated into project managing, one organizational procedure concerning project managing is given as an example in section 6.5.

9.7 Documentation

There have been many analyses of the kinds of discrepancy found in various audits of the quality assurance system. One which is always either at the top of the list or very near to it is documentation-related. There is so much of it about in the modern business, it is no wonder that it can so easily cause a problem.

The basic principle is that all documents should be reviewed and approved for adequacy by a qualified and competent person prior to issue. This control ensures that:

a) the pertinent issues of appropriate documents are available to all personnel whose work is essential to the efficient functioning of the established quality system;

b) obsolete documents are promptly removed from all points of issue or use.

Special attention should be paid to the preparation, handling, issuing and recording of changes, and to the effect which the proposed changes may have on the other parts of the procedure,system or service.

All changes of documents should be reviewed and approved by the same persons/organizations that performed the original review and approval unless specifically designated otherwise. The management should ensure that the designated persons/organizations have access to pertinent background information upon which to base their review and approval.

Where practical, the nature of the change should be identified in the document or in the appropriate attachments.

When practicable a master list may be established to identify the current revision of documents in order to preclude the use of non-applicable documents.

Documents should be re-issued after a practical number of changes.

Two particular aspects of documentation deserve particular emphasis because of the specific features of the consulting business and because of the style, intent and terminology of the quality assurance standards. These are work instructions and reports.

Work instructions

Quality assurance standard requires that everyone should have written work instructions **but only where they are considered necessary by responsible management.**

So, it does not mean that written instructions are necessary for every activity done in the name of the work. Many activities that are not written down are controlled perfectly well. That is one reason why personnel are taken on with certain qualifications.

There is no reason and common sense to develop a work instruction for an expert with an academic title who is engaged in the project. However, it is important to develop organizational procedures which will define the responsibilities and duties to all participants, and which will enable to have a common understanding of the business's and project's goal and their role within those.

Reports

Reports are essential evidence of conformance, both:

- of the product (in the consulting services the product is usually a document) to its requirements, and
- of the system to the standard's requirements.

Reports are incomplete if they do not show this.

Several types of reports concerning project management are given on the following few pages.

PROJECT PERFORMANCE EVALUATION REPORT

Project title :.....

Project No. :..... Client:.....

Date of last report		Date of this report	Date of next report
Project starting date		Project completion date	
Planned	Actual	Planned	Current estimate

Skeleton budget :

Summary of conclusions:

Summary of recommendations :

Distributed to : Date :

Project Manager:

PROJECT OUTPUT EVALUATION REPORT

Project title :.....

Project No. :..... Client:.....

This report refers to revision No..... from .....

If the status of the output is ☐ Satisfactory ☐ Unsatisfactory

If the status of the output is unsatisfactory, state :

A. What factors are causing this ? (Check as appropriate)

	Quality	Quantity	Timeliness
Inputs	☐	☐	☐
Experts	☐	☐	☐
Equipment	☐	☐	☐
Organization	☐	☐	☐
Technical problems	☐	☐	☐
Economic problems	☐	☐	☐
Other	☐	☐	☐

B. Explain each item checked above :

PROJECT OUTPUT EVALUATION REPORT

C. Recommendation:

- ☐ Undertake a technical, independent review
- ☐ Change a technical approach
- ☐ Redefine (clarify) one or more of the principal project design elements(objectives, outputs, workplan
- ☐ Other (please specify)

D. Explain items checked

E. Project completion date:

Originally planned:..... Current estimate:.....

F.Project manager comment :

Distributed to : Date :

Quality Assurance Manager:

It may be useful to have in mind following :

- Keep all your records and write them up promptly and regularly. Do not allow some important event not to be documented.
- Keeping adequate records is not difficult, and it need not be time consuming. It will help you to improve the way you perform your business, and to act quickly if problem arise.

9.8 Quality Assurance Standards

The definition of the Quality Assurance given in standard seems to be to philosophical - "quality assurance means all those planned and systematic actions needed to provide adequate confidence that product or service will satisfy specified requirements". This defir tion allows quality assurance to be thought of in any way that a person pleases.

So, let me make some statements on "what is quality assurance?":

1. It is our normal work.

2. It should have the aim of progressively improving quality.

3. The system must be defined and documented.

4. We must be able to demonstrate objective evidence of a planned and controlled approach to the achievement of quality.

5. The system must be subjected to periodic audits.

6. We must be able to demonstrate effectiveness of our corrective actions.

In quality assurance standards ISO 900x, the many existing national and international standards dealing with quality assurance systems are combined and unified.

Style and terminology are appropriate for taditional manufacturing industry. So, implementing a quality assurance system in a consulting/engineering company requires an additional effort to "translate" these standards to consulting business terminology and make it suitable for this type of business. The following international standards refer to quality assurance :

ISO 8402, Quality - Vocabulary

ISO 9000, Quality management and quality assurance standards - Guidelines for selection and use.

ISO 9001, Quality systems - Model for quality assurance in design/development, production, installation and servicing.

ISO 9002, Quality systems - Model for quality assurance in production and installation.

ISO 9003, Quality systems - Model for quality assurance in final inspection and test.

ISO 9004, Quality management and quality system elements - Guidelines.

ISO 9000 provides an overview of the ISO 9000 series of International Standards, and is a "road map" for use of the entire series.

ISO 9004 provides extensive quality management guidance to the company's management, for designing and implementing a quality system appropriate to its needs, without regard to contractual requirements of external quality assurance.

9.9 Effective Communication - Settlement of Claims

Quality experts say that quality is primarily a function of human commitment. When we are speaking about consulting services, the human commitment cannot be said to lie solely within the province of the consultant, but is partially at least a function of the relationship between the consultant and his client. It is the client that creates the opportunity for the consultant to exercise his innovative skills. Therefore to ensure that the project outcome is positive for all, it is essential to ensure that the relationship between consulting engineer and client does not unduly restrict creativity.

When a project goes wrong, the causes of the problems are usually multiple. But among them there is almost certain to be a failure of communication. Effective communication reaches out in all directions and at all levels. There must be regular and informed contact between the relevant people within each party's organization to prevent problems from occurring as much as possible. Ignoring warning signs instead of discussing them openly can lead to something that leaves a nasty taste - an expensive court case.

However, when a problem arises, effective communication can help to contain the damage and pave the way for equitable resolution. When things go wrong, then is not the time to start placing blame. It is more important to concentrate on keeping the lines of communication open.

9.10 Peer Review

There is increasing awareness worldwide of the need for project risk reduction as projects become more complex - hence the need for the greater attention to assurance of quality. FIDIC endorses such attention to quality, promoting concepts such as Peer Review. FIDIC has also recently formed a Quality Assurance Task Committee to investigate what assistance it can give to the profession in this area. This new initiative, together with the FIDIC guidelines and contractual publications will both assist in the Pursuit of Consulting Service Excellence.

CASE STUDY 1 PROJECT DESCRIPTION

In this case study it was explained how does ENCONET International develop and follow its projects. Forms for following the project, prepared by ENCONET International quality assurance department, were presented.

The case study was consisted of the following parts:
1. Description of the project proposal,

2. Project description,

3. Project development,

4. Forms for following the project.

The project proposal: "Industrial Energy Conservation in Eastern Europe" was presented.The project proposal was prepared for the Netherlands Government which will finance this project.

This project proposal has been the base for the project description which consist of the following parts:
a) Aims of the project,

b) Project organization,

c) Scope of the project,

d) Task and time schedule,

e) Resources,

f) Information campaign,

g) Results and reports.

The special attention was given to the time schedule. By means of the example mentioned above, the following steps were elaborated:
- the list of activities that must be performed in the project,

- the order in which the work must be done,

- the identification of the person responsible for each activity,

- the activity's duration estimation.

PROJECT DESCRIPTION

Name of the Project:

"Industrial Energy Conservation in Eastern Europe"

1. The Aims of the Project

- to create an avareness on energy conservation potentials in industry,

- to introduce the concept of energy cost / energy efficiency monitoring and determination at the industrial plant level,

- to develop an insight into the energy consumption structure and conserattion opportunities in selected industrial sectors:
    1. Food processing - Sugar refineries,
    2. Non-metallic industries - Cement, Glass, Bricks, Ceramics,
- information campaign and promotion of results.

The Project would reveal the following data:

1. Specific energy consumption in the selected sectors,

2. Energy efficiency,

3. Possibilities for immediate (low cost,no-cost) actions for improvement,

4. Other justifiable retrofiting measures,

5. Possibilities for combined heat and power production,

6. Possibilities for low quality fuel substitution,

7. Needs for obsolete technology replacement,

8. Needs for energy efficient equipment/technology.

1.1 Energy Management

To assure the realization of the energy conservation potentials it is not enough to perform just the energy audits, but it is also necessary to introduce the proper principles of energy

management into the practice of everyday operation and to set up appropriate of organization of energy sector within a plant.

1.2 Food processing and the non-metallic industry

Food processing industry is very important sector for Yugoslavia and this sector contribute to around 10 % of GNP in industry and around 8 % in energy consumption. Sugar refineries are among the largest energy consumers not just in food processing industries but in industrial sector on general as well. The average specific energy consumption goes up to the 26 GJ/t which is very high.

The non-metallic industries have the largest part in final energy consumption in industry and they are very attractive sector for determination of energy conservation potential.

2. Project Organization

2.1 The Contracting Partners

The contracting partners are:

MINISTERIE VAN ECONOMISCHE ZAKEN NETHERLANDS
HOOFDKANTOOR, BEZUIDENHOUTSEWEG 30,
2500 EC's-GRAVENHAGE

ENCONET INTERNATIONAL UNSKA 3, ZAGREB

2.2 Cooperation with NOVEM

NOVEM is the Netherlands agency for energy and the environment. Novem will help in preparation and execution of energy auditing on sectorial level and periodical follow-up the project.

2.3 The ENCONET International Team

[illegible]	ENCONET Zagreb	Project leader
Dr. Dušan Gvozdenac	ENCONET Novi Sad	Team leader
[illegible]	ENCONET Zagreb	
[illegible]	ENCONET Zagreb	

Tahir Kapetanovic, B. Sc.	ENCONET Zagreb	
Rajko Šenjug, B. Sc.	ENCONET Zagreb	
Jovan Petrović, B. Sc.	ENCONET Novi Sad	
Dragan Dukić	ENCONET Novi Sad	

The Netherlands Team

Theo van Rossum	NOVEM	Project leader

2.4 Resources

ENCONET operates 2 ENERGY BUSES - mobile diagnostic units - with advanced equipment for detailed in-house audits, testing and surveys. ENCONET has adequate computing facilities supported by proven software packages for financial and technical analyses.

3. Task and Time Schedule

The project consist of eight tasks:

- Task 1: Preparation of audits for 30 factories
- Task 2: Preparation of any single audit
- Task 3: Detailed in-house measurement
- Task 4: Analyses and calculation - Energy balances
- Task 5: Measures to reduce energy utilization
- Task 6: Prefeasibility study for all measures
- Task 7: Priority listing of measures
- Task 8: Preparation of aggregate report for whole project

Task 1: Preparations of audits

- Selection of 30 factories for energy audit
- Time schedule for:
    - the first informative visit to factory

- detailed in-house measurement
- preparation for data reports

- Determination of data which has to be measured

- Measurement planning

- Seminar for experts and members of teams
  - to unify the results of measuringand calculation

Task 2: Preparation of any single audit

- The first informative visit to factory

- Plant inspection

- Preparing the comprehensive program of audit:
  - surveying local conditions,
  - surveying technological processes and equipment,
  - surveying buildings,
  - collecting bills for energy
- Working out the auditing schedule based on:
  - the volume of energy consumption,
  - expected energy savings

Task 3: Detailed in-house measurement

- Measurement plan,

- Detailed in-house measurement,

- Measurement report.

Task 4: Analyses and calculation

- Energy balance

- Sankey diagram

Task 5: Measures to reduce energy utilization

- Preparation of the technical report including proposals and recommendation for the improvement of energy consumption.

Task 6: Prefeasibility study

- Cost calculation for all measures.

Task 7: Priority list of measures

- Priority list of measures according to calculated cost, for particular energy conservationmeasures.

Task 8: Preparation of the aggregate report for whole project

- This report consists of:
  - list of factories,
  - measurement reports,
  - energy balances and Sankey diagrams,
  - cost calculations,
  - priority list of measures,
  - conclusion.

4. The Energy Audit

An energy audit is the fundamental part of any energy management programme of any organization which wishes to control its energy.

The purpose of energy auditing is to identify the losses in the use of energy (conversion and consumption) and then to find the way of reducing or eliminating those losses.
In the course of energy audit it is necessary to:

- Determine accurately the total consumption of every energy carrier,
- Examine why, at what equipment and in what volumes the different energy carriers are used,
- Determine how much of each energy carrier is consumed usefully, depending on the type of technology and manufacturing equipment, installed and how much is lost,

- specify unavoidable losses, which occur due to the lawsof physics and due to the nature of energy use and conversion and specify the other losses, volume of which can be affected, covered or fully avoid.

In order that the energy audit be effective, it is very important that the aim of the project be well defined to ensure that the results truly provide the necessary data needed for the basis of an evaluation of saving potential. It is essential that the qualified experts are available for this part of the project. The knowledge required is, first and foremost in the fields of measurement technique, but also knowledge and experience in e.g. process technique can be necessary.

There are generally two types of energy audit:

1. short or overview audit deals with:
   a) simple maintenance tasks,
   b) items which need to be looked regularly,
   c) areas where employees are causing energy waste,
   d) the existing meters that should be noted.

2. The diagnostic energy audit

In the diagnostic audit the additional measurements are installed on all or selected major items of the plant and the energy consumption is monitored simultaneously over a fixed period of time to gain a picture of the average pattern of energy use of the whole site. The result of the energy audit should be an energy balance and a detailed study of this allows an evaluation to made in regard as to which energy conservation measures should be implemented.

5. Energy Buses of ENCONET International

DESCRIPTION OF FACILITIES -

5.1. Measurement of electrical values

- measurements of current, voltage, active and reactive power by means of measurement transducers and clip transformers during operation,
- recording of transient phenomena by means of storage oscilloscope with possibility of photo-recording of measurement,
- illumination measurements,
- possible simultaneous measurements of up to 32 values with continuous recording on computer disc, tape, etc.

5.2. Temperature measurement

- temperature measurements up to 1100 C by means of thermoelements, Hg thermometers, Pt 100 with various types of probes.

5.3. Pressure measurements

- pressure transducers in an area 0 - 10 bar (Hartman & Brown, ATM, Westinghouse),

- underpressure measurements by means of U-tube,

- electronic diff. micropressure meter ("Solomat"),

- Pitot-Prandtl tube.

5.4. Measurements of air properties

- flow rate measurements (0.2 - 40 m/s) by means of anemometer, measurements of differential pressure in channels, relative humidity, temperature.

5.5. Measurements of fluid flow

- measurement path with orifice for measurements of flow in pipelines (up to No 20).

- ultrasonic measurement of steam losses on steam traps.

5.6. Determination of flue gases composition

- "Testoterm 32", measures CO, CO2, O2 and temperature of flue gases, and determines h,

- Orsat's device.

5.7. Measurements acquisition system

5.8. Measurement of conditions in working environment

- noise, vibrations. (Bruel & Kjoer" DK)

5.9. Communication equipment

- 3 hand held comm. units. (ICOM IC-H2).

6. Information campaign

It has two phases:

- during the preparation of the project,

- after the completion (promotion of results).

It consists of advertisement in national newspapers and TV; design, preparation and publishing of promotional materials - folders, booklets, posters, etc.

7. Results and Reports

All results will be shown separately for every audit and in an aggregate report for the whole project for each industrial sector. The most profitable retrofit measures will be highlighted and corresponding costs calculated.

ENCONET INTERNATIONAL	LIST OF ACTIVITIES	Page 1 of 5

PROJECT : Industrial Energy Conservation in Eastern Europe

CLIENT : Ministerie van Economishe Zaken Netherlands

CONTRACT : Nr. 19/91.

No.	Prev. act.	Name of the activity	Foll. act.	Respon. person	Dur.
100		Project preparation	200	Morvaj, Rossum	5
200	100	External Consultancy provided by NOVEM	300, 1200	Rossum	10
300	200	Preparation of audits	400	Tomšic	40
400	300	Preparation of any single audit	700	Tomšić, Gvozdenac	36
700	400	Detailed in house mesurement	1000	Tomšić, Gvozdenac	42
1000	700	Analyses and calculation	1100, 1300	Tomšic, Gvozdenac	102
1100	1000	Preparation of the agregate report for whole project	1400	Tomšić, Gvozdenac	30
1200	200	Information campaign	1300	Šenjug	196
1300	1000	Public promotion of results	1400	Morvaj, Šenjug	20
1400	1100	END			
	900				
310	300	Selection of factories for energy audits	320	Tomšic	10
320	310	Time schedule for the first visit	330	Tomšic, Gvozdenac	10
330	320	Time schedule for detailed in house measurement	340	Tomšic, Gvozdenac	10
340	330	Measurement planning-determination of measured data	350	Tomšic, Tomiša	5
350	340	Seminar for experts and members of team	400	Tomiša, Gvozdenac	5

Project Manager: Željko Tomšic

EI-FORM 17-QA (E) 04.91.

Date : 14. 05. 1991.

No.	Prev. act.	Name of the activity	Foll. act.	Respon. person	Dur.
402	400	Firts informative visit to factory Z1	404	Tomšič	1
404	402	Preparing the compresive program of the audit Z1	406	Tomšič, Gvozdanac	2
406	404	The auditing schedule Z1	408	"	1
408	406	Measurement plan Z1	702	"	2
702	408	Detailed in-site measurement Z1	704	"	5
704	702	Measurement report for Z1	416	"	2
416	414	First informative visit to factory NS1	418	"	1
418	416	Preparing the compresive program of the audit NS1	420	Tomšič, Gvozdanac	2
420	404	The auditing schedule NS1	422	Tomšič, Gvozdanac	1
422	420	Measurement plan NS1	706	"	2
706	422	Detailed in-site measurement NS1	708	"	5
708	706	Measurement report NS1	1002	"	2
1002	426	Energy balance for factory Z1	1004	"	3
1004	1002	Sankey diagram Z1	1006	"	2
1006	1004	Measures to reduce energy utilization Z1	1008	"	3
1008	1006	Technical report for factory Z1	1010	"	3
1010	1008	Cost calculation Z1	1012	"	5
1012	1010	Priority list of measures for factory Z1	1014	"	1

Project Manager: Tomšič

No.	Prev. act.	Name of the activity	Foll. act.	Respon. person	Dur.
1014	1012	Energy balance for factory NS1	1016		3
1016	1014	Sankey diagram NS1	1018		2
1018	1016	Measures to reduce energy utilization NS1	1020		3
1020	1018	Technical report for factory NS1	1022		3
1022	1020	Cost calculation NS1	1024		5
1024	1022	Priority list of measures for factory NS1	424		1
424	1024	First informative visit to factory Z2	426	Tomišo	1
426	424	Preparing the compresive program of the audit Z2	428	Tomšic	2
428	426	The auditing schedule Z2	430	"	1
430	428	Measurement plan Z2	710	"	2
710	430	Detailed in-site measurement Z2	712	"	5
712	710	Measurement report for Z2	432	"	2
432	712	First informative visit to factory Z3	434	"	1
434	432	Preparing the compresive program of the audit Z3	436	Tomšic	2
436	434	The auditing schedule Z3	438	Tomšic	1
438	436	Measurement plan Z3	714	"	2
714	438	Detailed in-site measurement Z3	716	"	5
716	714	Measurement report Z3	1026	"	2

Project Manager: Zeljko Tomšic

Date : 14. 05. 1991.

No.	Prev. act.	Name of the activity	Foll. act.	Respon. person	Dur.
430	1024	First informative visit to factory NS2	432	Petr[illegible]	1
432	430	Preparing the compresive program of the audit NS2	434	Petr[illegible]	2
434	432	The auditing schedule NS2	436	Gvozd[illegible]	1
436	434	Measurement plan NS2	718	Petr[illegible]	2
718	436	Detailed in-site measurement NS2	720	"	5
720	718	Measurement report NS2	438	"	2
438	720	First informatie visit to factory NS3	440	"	1
440	438	Preparing the compresive program audit NS3	442	"	2
442	440	The auditing schedule NS3	444	"	1
444	442	Measurement plan NS3	722	"	2
722	444	Detailed in-site measurement NS3	724	"	5
724	722	Measurement report NS3	1038	"	2
1026	716	Energy balance for factory Z2	1028	Tom[illegible]	3
1028	1026	Sankey diagram Z2	1030	Tom[illegible]	2
1030	1028	Measures to reduce energy utilization Z2	1032	Tom[illegible], Tom[illegible]	3
1032	1030	Technical report for factory Z2	1034	Tom[illegible]	3
1034	1032	Cost calculation Z2	1036	Tom[illegible]	5
1036	1034	Priority list of measures for factory Z2	1038	Tom[illegible]	1

Project Manager: [illegible]

Date : 14. 05. 1991.

No.	Prev. act.	Name of the activity	Foll. act.	Respon. person	Dur.
1038	1036	Energy balance for factory Z3	1040	[illegible]	3
1040	1038	Sankey diagram Z3	1042	[illegible]	2
1042	1040	Measures to reduce energy utilization Z3	1044	[illegible]	3
1044	1042	Technical report for factory Z3	1046	[illegible]	3
1046	1044	Cost calculation Z3	1048	[illegible]	5
1048	1046	Priority list of measures for factory Z3	1100	[illegible]	1
1050	1048	Energy balance for factory NS2	1052	[illegible]	3
1052	1050	Sankey diagram NS2	1054	[illegible]	2
1054	1052	Measures to reduce energy utilization NS2	1056	[illegible]	3
1056	1054	Technical report for factory NS2	1058		3
1058	1056	Cost calculation NS2	1060		5
1060	1058	Priority list of measures for factory NS2	1062		1
1062	1060	Energy balance for factory NS3	1064		3
1064	1062	Sankey diagram NS3	1066		2
1066	1064	Measures to reduce energy utilization NS3	1068		3
1068	1066	Technical report for factory NS3	1070		3
1070	1068	Cost calculation NS3	1072		5
1072	1070	Priority list of measures for factory NS3	1100		1

Project Manager: [illegible]

Date : 14. 05. 1991.

CASE STUDY 2 OFFERING AND PRESENTATION

[illegible] International,

Zagreb, Croatia

This case study was intended to be a training on offering and presentation. Each participant has presented one activity, service or institution. All presentations were recorded. So each participant was able to see his own presentation on the later video-reproduction, and to correct himself. Moreover, all presentations were commented and discussed in a round table discussion.

CASE STUDY 3 SOFTWARE REVIEW AND PRESENTATION

R. Šenjug, ENCONET International,

Zagreb, Croatia

By means of an example, and the presentation of "Super Project Expert" software, the advantages of using personal computers in project managing were described.

It was shown how a project management software can support and expedite managing, monitoring and tracking of a project from the beginning to the end.

The following advantages were pointed out and demonstrated:

- "what if" analyses that consider alternative scenarios,

- scheduling information displayed as a Gantt chart or a PERT chart,

- the project dependencies and the sequence of tasks with the critical path displayed as a PERT chart,

- interactive resource managing with analyses of resources loads in a single project or across many projects,

- design of the up-to date reports that responds to different reporting needs.

At the end, the review of the project management software products was given.