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## Introduction

The lubricating oil basestock industry will be undergoing radical changes in the next two years. The startup in 1997 of the new Conoco/Pennzoil plant (described in part I of this brochure) will add up to 10% additional capacity. In addition the industry continues to face increasing worldwide competition and rising operating costs due to stricter environmental regulations and more stringent product quality demands.

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### Volume I - The Conoco/Pennzoil Venture

Will analyze the new Conoco/Pennzoil Venture in detail and help clients determine how their manufacturing facility stacks up against what is claimed to be the most modern and efficient plant in the US.

*Information about this study and the pre subscription offer is presented in a separate brochure.*

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### Volumes II and III - The Changing Face of the Lube Oil Basestocks Business - *North America, Europe and Asia*

These two volumes, described in this brochure, will provide a thorough analysis of the commercial issues surrounding the entire basestock business. Volume III will focus on North America and Volume II will concentrate on Europe and Asia. The studies will analyze and compare the economics and technologies of the manufacturers in these regions – data essential to critical strategic planning.

More than just comparative studies, these valuable reports will provide crucial information on:

- Key business drivers affecting supply and demand
- Demand and assessment and projections
- Supply structure analysis and projections
- Technology and manufacturing cost assessments of each player
- Industry competitive analysis
- Pricing Dynamics
- Overall Business Assessment

Kline & Company is ideally qualified to prepare these studies. We have a long track record and list of successful assessment in this field. Our staff includes experts that specialize in this industry.

*This is a pre subscription offer to Volumes II and III.*



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## Background

The paraffinic lubricant basestock industry has been facing increasing competition and costs since 1980. New market demands stretch technological capability to its limit. Product specifications are more stringent requiring products with:

- lower volatility
- lower viscosity and
- improved low temperature properties

In addition, manufacturers are faced with increased capital expenditures in order to meet environmental and supply side challenges. This affects operating costs and profitability.

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### Environmental Challenges:

Environmental regulations require fundamental changes in processing technology in order to meet new Clean Air Act and SARA Title III requirements. For example, SARA Title III regulations currently impact MEK/Toluene solvent dewaxing specifically.

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### Supply Challenges:

- Degrading feedstock quality places special demands on existing plants.
- A changing mix of imports and exports affects US supply.

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### Technological Competition:

To meet these challenges, technology is improving. New processes such as catalytic dewaxing are being pursued. Those players implementing new technologies may have long-term competitive advantages.

**The increased capacity and new technologies implemented in the new Pennzoil/Conoco Lake Charles, LA facility will certainly affect the position of the other players.**

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### The next years will be crucial to survival

The lubricating oil basestocks business is undergoing such radical changes that, for their business to survive, executives will be forced to make critical strategic decisions. Most important, they will need to prepare revised long term business plans based on the latest information – if they are to continue to maintain their position.



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## Objective

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### Data that will be presented

Each manufacturer faces different challenges and has a unique market position. To make informed decisions, business executives will need accurate comparative data on each of the manufacturers in the field. Further, they need an analysis that clearly identifies what the driving and controlling business factors are for each manufacturer, so they can focus on the most important issues concerning their individual plants.

In view of these needs, the objectives of this study will be to:

- Determine and quantify the primary driving forces that will affect supply and demand in the next four years.
- Assess what the projected demand will be to the year 2000 for each basestock
- Assess the supply structure and project what the supply will be for each basestock to the year 2000
- Gather and analyze up-to-date information on the manufacturing practices of each player and thus determine their current relative cost position for each basestock.
- Determine the current and projected pricing dynamics of each product and in each region.
- Based on all of the data gathered, assess the future of the lube oil basestock business under different scenarios.

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### How will this study help you?

The ultimate goal of this study is to assist executives in making informed decisions that affect their business using reliable and accurate up-to-date information. The information presented in these studies will assist you in:

- Deciding to invest more capital
- Identifying where to focus capital expenditures based on their particular position in the market place
- Determining which plants are the best choices for consolidation
- Developing effective pricing strategies (which products should go up in price, which should go down and where)
- Projecting possible plant closures, expansions

The study can also be invaluable to investors looking for opportunities in mergers and acquisitions.



## What Volumes II and III Will Cover

### Overview

**The study will be divided into two volumes:**

- Volume II - Europe and Asia
- Volume III - North America

**Each volume will be divided into these major sections:**

1. Business Forces Driving Supply and Demand
2. Demand Analysis and Projections
3. Supply Structure Analysis and Projections
4. Technology and Manufacturing Cost Assessments
5. Industry Competitive Analysis
6. Pricing Dynamics
7. Overall Business Assessment

The following is a brief description of the major sections.

### 1. Business Forces

#### Driving Supply and Demand

In order to predict what the future supply and demand will be, we first identify and *quantify* the forces that affect and drive these parameters. This portion of the report will analyze the current market drivers in detail and provide quantitative data. Below is a partial list of the kinds of business drivers that will be examined in detail. Others will be added as uncovered by the study.

Demand Driving Forces	Supply Driving Forces
Lubricant growth rates	Merchant marketing, "swapping"
Formulation approaches	Changes in product specifications and performance requirements
Basestocks Splits	Increased competitive capacity



## 2. Demand Analysis and Projections

This section will provide a thorough analysis of demand issues. It will provide data on:

- Historical demand from 1990-1995 by basestock
- Projections of demand to the year 2000 by basestock

### **Basis for this analysis:**

This information is developed based on historical data. The quantitative data on the forces affecting demand, developed in section 1, is used to project the historical data to the year 2000.

## 3. Supply Structure Analysis and Projections

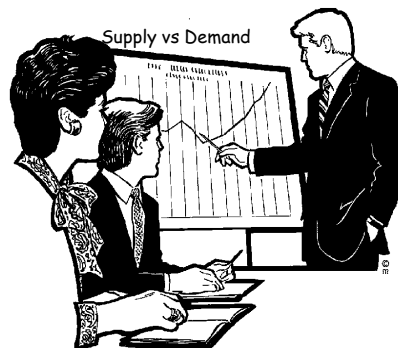
In order to assess the total supply of basestocks by grade, we look at each player in detail and will include the following data:

- Supplier profiles detailing quantities of each grade supplied by each player.
- A breakdown of nameplate capacity and production levels by grade and basestock type.
- Historical supply data and projections to the year 2000

### **Basis for this assessment**

This information is developed by through direct and indirect resources. Direct sources provide first hand information. Indirect sources provide clues, such as:

- predicted plant shutdowns
- new players entering the market
- customer base
- captive demand
- alternative uses of feedstock serving the basestock unit
- and by/coproduct disposal/marketing issues.






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#### 4. Technology and Manufacturing Cost Assessment

This section will present detailed technology and economic profiles on each of the manufacturers in the region under study. We will identify the technology applied by each manufacturer. Typical technologies are itemized in Table 1.

##### **The Kline Difference ä:**

*You pay for current data on actual current operating practices, a real value...*

But just knowing what type of process each plant is using is not enough and not the real value of this unique study. You need to know exactly how each manufacturer actually runs their plant *currently*. This is because manufacturing practices change with demand and vary from year to year. To gather this critical data, our team conducts hundreds of interviews to determine current practices using our unique Kline methodology (below). An expensive but worth while procedure that yields accurate and reliable results. Anyone can provide a manufacturing assessment based on theoretical manufacturing performance, but our data is based on actual practice and this could make the difference between the right decision and the wrong decision in your business. That is *The Kline difference*.™ This is why the economic analyses we generate based on this data are more reliable and accurate.

**Table 1**

**Core Technologies Used In Basestock Manufacturing**

Solvent extraction	Dewaxing	Finishing
Furfural	MEK/Toluene	Hydrofinishing
NMP	Catalytic dewaxing	Clay finishing
Phenol	Dil chill	Bauxite percolation

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#### 5. Industry Competitive Analysis

Based on the data provided in section 4, we determine who will be the cost leaders in the industry. Cost leadership will be projected for each quarter.

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#### 6. Pricing Dynamics

This section will provide a detailed analysis of the pricing dynamics of each viscosity grade and for each refiner based on supply and demand trends. Projections to the year 2000 will be presented.



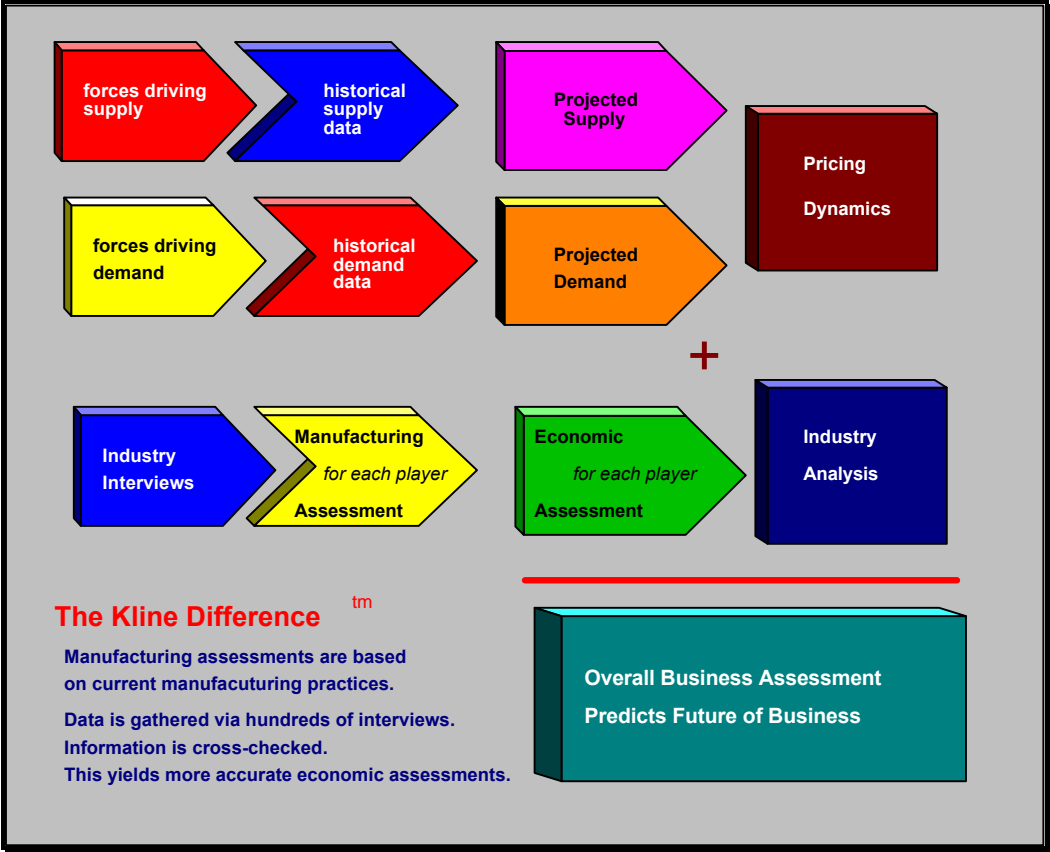
### 7. Overall Business Assessment

The conclusion of the report will present an analysis that will tie together the demand, supply, technology and other commercial factors into an overall business assessment of the lubrication oil basestock business in the region of study.

It will provide an assessment most likely scenario for the future of the business and alternative scenarios based on varying:

- Basestock performance, leading to several demand scenarios
- Supply, particularly several sets of supplier exit scenarios
- Pricing, focused on depth and breadth of expected margin compression

Figure 1  
Schematic of Kline's Approach to Market Study Development





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# The Changing Face of Lube Oil Basestocks Business

## *Table of Contents*

### **Volume II -Europe and Asia Volume III - North America**

#### **A. INTRODUCTION**

#### **B. Business Drivers**

1. Supply Issues
  - a) Lubricant Growth Rates
  - b) Formulations Approaches That Will Be Used
  - c) Splits Of Types Of Basestocks Expected To Be Consumed
2. Demand Issues
  - a) Merchant Marketing of Lube Oil Basestocks
  - b) Changes in Performance Requirements
  - c) More Stringent Oil Volatility Requirements

#### **C. Market Demand Assessment**

#### **D. Supply Structure Analysis**

1. Overall Supply Analysis
2. Supplier Profiles
3. New Entrant Assessment

#### **E. Technology and Manufacturing Cost Assessment**

1. Technology Assessments
2. Economic Assessments

#### **F. Industry Competitive Analysis**

#### **G. Pricing Dynamics**

#### **H. Overall Business Assessment**



## What Makes Kline Special?

Since our founding over 35 years ago, Kline & Company, Inc. has become a global leader in business research and strategic consultation to the petroleum, chemical and allied industries. We have developed a reputation for accuracy and reliability. What makes us special?

### Two things:

#### Our Methods

Developed over thirty five years of experience, our systematic approach to gathering and analyzing information guarantees results

#### Our Team Approach

We employ experienced professionals, each specializing in their particular field. We organize our experts into effective teams, each member contributing a particular expertise. Our project team can also draw on the expertise of the rest of the Kline professionals to assist them with the study.





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## The Kline Difference ä

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### **Our unique approach to Manufacturing Economics Analysis guarantees success and has earned us our excellent reputation**

Kline has a reputation for providing accurate and timely strategic manufacturing economic analysis information. We have prepared many successful studies in a variety of areas. Our clients rely on this information for strategic planning and key marketing decisions. They trust our integrity and the reliability of the data.

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### **Why Are We Successful?**

Our costs structure assessments are based on how competitors actually practice their specific technologies, rather than how it appears on paper. Gathering and analyzing this kind of critical information requires a special set of skills, an experienced team and a unique and thorough three-phase approach that takes no shortcuts.

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### **Phase 1 - Preliminary Concept Development**

We gather all available non-confidential information or what we refer to as secondary information. This involves a thorough and exhaustive review of:

- patents
- technical conference papers
- non-confidential information from our database
- the experience of our unique team of experts
- data provided by clients sponsoring the study in question

Phase 1 of our analysis allows us to establish the preliminary concepts. It draws a preliminary picture of the technology and market and provides the foundation for the more detailed second phase of the analysis.



## Phase 2 - Industry Interviews

Armed with a thorough understanding of the preliminary concepts, our team of industry experts conducts detailed and exhaustive industry interviews to develop the primary information, the cornerstone of our work. The primary information often reveals details not found in secondary sources. To successfully develop reliable and accurate primary information, we use a unique "matrix" approach.

Engineering Firms	Equipment Vendors	Raw Material Suppliers	Customers	Other Industry Participants
☑	☑	☑	☑	☑
☑	☑	☑	☑	☑
☑	☑	☑	☑	☑

### *The Interviews Matrix*

The matrix includes a list of possible contacts in a number of industry categories including raw material suppliers, customers, engineering firms, and other industry participants. The matrix is so devised, that information will be cross-checked several times and will provide the required information even if only a portion of the matrix is responsive. This scientifically devised matrix approach guarantees results and is one of the key factors in our success. Filling in the matrix information requires special skills and a thorough understanding of the industry.

The primary information and secondary information developed is used to prepare a preliminary cost estimate.

## Phase 3 - Reliability and Accuracy Check

But we don't stop at phase 2, where most consultants may choose to stop. We go even further. ***We cross-check all of the cost information we develop by conducting additional interviews with organizations directly involved in the production of the products under analysis.*** This is how we ensure that the data we developed on paper based on primary and secondary sources is accurate and reliable.



# The Unique Kline Project Team

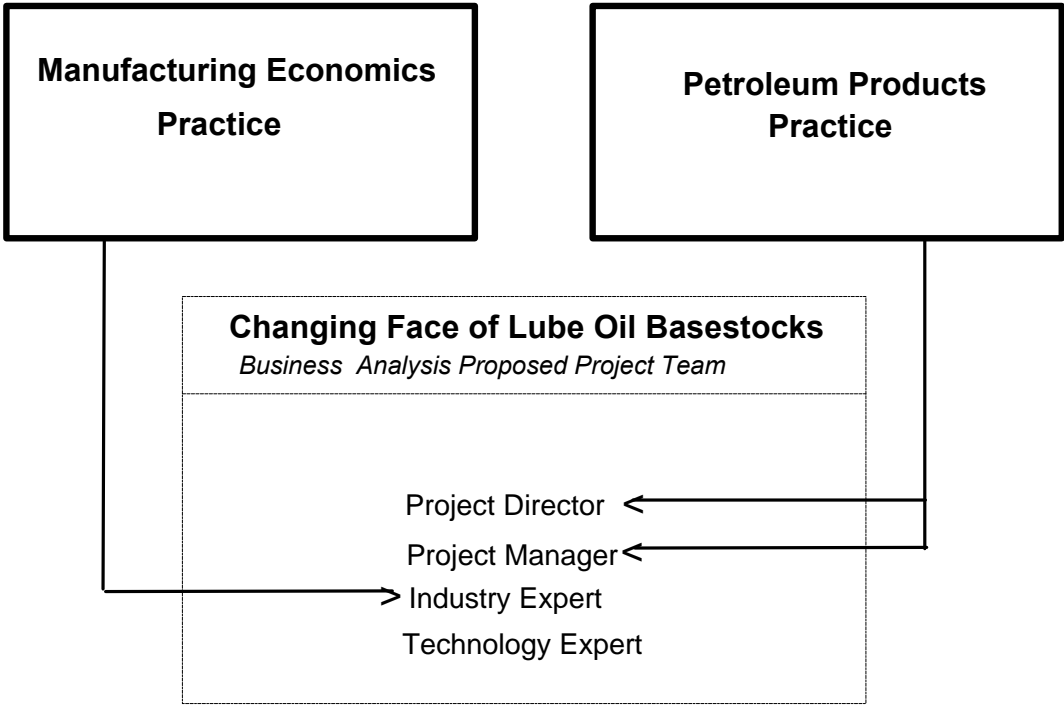
We use specialized personnel organized in cooperative project teams. Each team member has a particular set of expertise to contribute. They work together through all three phases of our study, to develop accurate information.

The team will consist of:

- A project director
- One or more technical experts
- One or more business or marketing experts
- One or more project specialists with special skills in developing primary information

These team members can draw upon other Kline resources and will develop the industry information from sources outside of Kline. The project team for this study will consist of members from both our Petroleum Practice and Manufacturing Economics Practice, as shown on Figure 2.

**Figure 1**  
**The Project Team**





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## Our Credentials

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### An International Firm

Established in 1959, Kline & Company, Inc. is an international business consulting firm offering a comprehensive range of services to the chemical and petroleum industries. Its headquarters are in Fairfield, New Jersey and we currently have representative offices in:



- Brussels, Belgium
- Tokyo, Japan
- Melbourne, Australia
- Hong Kong
- Monterey, Mexico
- Sao Paulo, Brazil

We have a reputation for delivering high quality studies and assessments. In the last 30 years we have completed 4000 proprietary assignments and close to 150 multi-client studies.

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### Our Human Resources - Our Best Asset

Kline's resources include experts in all areas of the chemical and petrochemical fields. This diversity allows us to tailor a special project team for each study that provides the right blend of expertise in the fields of marketing, technology, manufacturing economics, intelligence, and strategic planning.



Our project teams are experienced at researching and analyzing information available from a variety of industry sources external to Kline. They are supported by the entire Kline team, providing a wealth of experience and knowledge within our firm. This high level of technical support and expertise allows us to maintain a high standard of execution and consistently deliver quality studies and assessments.



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## Kline's Key Strength Is Clearly The Depth of Industry Experience

Kline currently has 12 "practices", each specializing in a particular product area. Each Product Practice Team consists of experts who have demonstrated records of success and years of experience in these industries. As previously indicated, the project team for the Assessment of the Conoco/Pennzoil Venture is composed of members of each of two practice teams:

- The Petroleum Products Practice Team
- The Manufacturing Economics Practice Team

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### Our Petroleum Products Practice Team

Our Petroleum Products Practice Team consists of:

- Five full-time professionals
- Four with major oil or key independent experience in lubricants
- A combination of sales, product and market development and technical service experience
- A combined 60 years of lubricants, chemical and consulting experience.

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### Our Manufacturing Economics Practice Team

Kline's Manufacturing Economics Practice has completed numerous technology assessments for companies in the refinery and chemical processing industries. This group specializes in business problem solving. We call upon this team whenever clients need to:

- Benchmark their technology against competing technologies
- Re-engineer and improve their manufacturing cost position
- Evaluate the impact expansion or consolidation of manufacturing capacity will have on their overall manufacturing cost.
- Evaluate the cost structure of new technologies prior to implementation

As stated before, these clients value the level of detail, the accuracy and reliability of the cost assessments we develop. The survival of their business depends on the critical strategic technology and marketing decisions they make based on the data Kline provides.

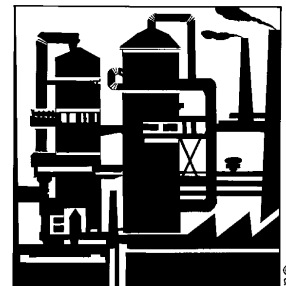
Our assessments are complete and comprehensive. They include details of the critical factors that affect the manufacturing of the technology under study.



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## Relevant Assessments and Studies

The Manufacturing Economics Practice team has worked with the Petroleum Practice team to complete a number of relevant assignments, including business strategies, acquisitions analysis, manufacturing economics, competitive assessments, lubricants (base stocks and finished), market size and segmentation, image analysis, and other proprietary assignments. This experience has also been pivotal in the ongoing success of our highly regarded continuing program, *Opportunities in Lubricants*, and other syndicated studies including:



- *The Outlook for Petroleum Waxes 1990-2000*
- *Lubricants and Fuel Additives 1990*
- *Investment Opportunities in Specialty Lubricant Manufacturers 1988*
- *The Outlook for Petroleum Waxes 1985-1995*
- *Industrial Oils and Functional Fluids 1982*
- *Automotive Motor Oils 1980*
- *Industrial Oils and Functional Fluids 1977*

In addition, in the last six years we have completed fifteen major single client studies in the basestock area. Our basestock expertise was recently recognized by Shell Oil Company, which retained us to deliver a talk to an audience of basestock suppliers at the Shell/Houston Open. This talk examined basestock supply/demand, changing performance requirements, and the role of unconventional basestocks in various formulation applications.



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# Terms of the assessment

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## Confidentiality

To ensure each subscriber obtains the maximum benefit from this new assessment, Kline & Company, Inc. agrees to:

1. Keep the identity of each subscriber confidential
2. Keep the information developed confidential and limited to subscribing companies for a period of three years

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## Schedule of Completion

Decision to Launch	2nd Quarter 1996
Completion	4th Quarter 1996



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# Subscription Offer