

PLASTICS BUSINESS AREA SUMMARY

	<u>1979 Budget</u>	<u>1979 Forecast</u>	<u>1980 Budget</u>	<u>1981</u>	<u>1982</u>
After-Tax Profit, \$M	6,429	12,650	6,458	10,805	16,101
Capital Commitment, \$M	3,100	18,700	8,932	60,200	9,300
Netback Price, PVC Resin, ¢/lb.	21.7	26.5	27.7	28.8	32.2
Production (PVC Resin), MM lbs.	545.0	534.5	550.0	662.0	714.0
Assets Employed, \$M	44,100	44,100	55,600	72,800	76,800
ROA, %	14.4	28.7	11.6	14.8	21.0

Background

CONOCO entered the plastics business in the early 1960's through acquisition of plastic pipe and other vinyl fabrication facilities. This was followed by the acquisition of PVC resins, compound, and plasticizer facilities in 1964 and up-stream integration to vinyl monomer plant in 1968. In 1972, there was a change in strategy with CONOCO selling its fabrications facilities, concentrating its efforts on resins, dry blends and compounds, where our integrated feedstock position and large volume process techniques gave us the most competitive advantage. CONOCO retained a PVC resin plant in Oklahoma City and a resin/compound/dry blend plant in Aberdeen with a combined capacity of 350 MM lbs. of PVC resin. Over the last six years, there has been a tremendous modernization of these facilities to meet OSHA and EPA vinyl emission standards and to capitalize on our more efficient large reactor (20 M gallons) PVC technology. This effort culminated with the start-up of four large reactors shut down in 1975. Our current annual capacities are as follows:

	<u>Aberdeen, MS</u>	<u>OKC, OK</u>	<u>Total MM Lbs.</u>
PVC Resin	335 MM	215 MM	550 MM
Vinyl Compound	65	-	65
Dry lend	77	-	77
Plasticizer	25	-	25

The plastics industry continues to show strong growth with 1979 at 8% above the 1978 level. While the expected recession will limit its growth to less than 4% in 1980, the trend line for plastic resins is projected at greater than 8% per year over the next decade. This high growth rate should be achievable as plastics continue to penetrate markets traditionally held by products, such as wood, steel and glass. For the past ghree years, we have explored entry into a new plastics resin business. After a thorough screening process, high density polyethylene and polybutene emerged as the two most attractive candidates. We are now pursuing the license of technology from Nissan as the most logical entry option.

Individual write-ups for PVC resins, dry blends and compounds appear in the following sections. We will issue our operations plan on high density polyethylene as it becomes appropriate.

VINYL PLASTICS BUSINESS SUMMARY

The PVC industry consists of 21 producers of which 14 are primarily integrated into downstream fabrication facilities, six are upstream integrated into VCM and either ethylene or chlorine while four are neither up nor downstream integrated. While there are four less producers than three years ago, compliance with EPA and OSHA regulations has not eliminated the number of plants that was originally forecast. The industry continues to be highly competitive with company motives ranging from "it's better than the rubber business" to selling incremental chlorine to value added on petroleum feedstocks.

Since the beginning of this decade CONOCO has been the largest producer of pipe grade resin. This developed logically from our ownership of Carlon. CONOCO was the first U.S. company to commercialize PVC production facilities with reactors larger than 5,000 gallons. As our requirements were primarily for pipe grade resin, our large reactor technology efforts were concentrated in this area. The large reactor technology did provide us with the competitive operating edge in manufacturing a pipe grade resin. While the fastest growing market for PVC resins, the pipe market also yielded the lowest prices and greatest customer instability.

In 1973, we set out to modernize our business. Our first objective was to replace the small reactors in Aberdeen with the more efficient 20M gallon reactors. This not only reduced our operating costs, but helped improve quality and made it easier to comply with EPA standards. The large reactor pilot plant was commissioned in 1975 to provide information necessary for quality improvement, productivity advances, and development of emission controls. We also set out to improve the balance of our business through development of resins, dry blends and compounds for the automotive, wire and cable and profile markets.

Most of our objectives in building a sound foundation have been accomplished. The small reactors in Aberdeen were replaced, EPA and OSHA compliance equipment installed, high quality wire and calendaring resins have been developed, the new compound line replacing Line 1 is under construction, dry blend capacity has been increased 150% and marketing diversification plans implemented.

The emphasis over the next three years will be to capitalize on our low cost large reactor technology, integrated feedstock position, and broad product line to increase our share of the growing vinyl market.

Business Strategy

From an analysis of our current industry position, technical and marketing strengths and the opportunities for growth over the next three years we developed the following strategy:

- 1) Capitalize on the economic advantage of CONOCO's large reactor technology which should enable us to make an above average return.
- 2) Increase our share of the merchant market from 15% to 16% (resin equivalent) by 1982.

- 3) Continue diversified growth in five major submarkets of the construction and transportation industries with emphasis on the high growth pipe and extrusion profile markets.
- 4) Maintain a balanced growth pattern between PVC resin, dry blend and compound utilizing dry blend and compound as the leading edge to new markets.
- 5) Develop improved resins while maintaining our current high productivity.
- 6) Utilize Lake Charles as the site for the new grass roots PVC plant to be committed in 1981.
- 7) License CONOCO's PVC technology in foreign markets.

Business And Industry Conditions

While PVC demand should reach 5.98 billion lbs. in 1979, 1980 looks like a recession year with recovery in the late third and fourth quarters. Our demand model for the PVC industry projects a 3.8% growth in 1980 rebounding to a 11.1% growth in 1981 and 7% in 1982. These demand projections are based on DRI macro-economic forecasts which are integrated with our estimate of market penetration rates and historic SPI statistics. The forecast for several key indicators used in developing PVC growth rates are as follows:

ECONOMIC OUTLOOK

<u>Economic Indicator</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
GNP (Billions 1972 Dollars)	1412	1426	1482	1668
Investment Residential Const. (Billions 1972 Dollars)	54	53	61	65
Investment Non-Residential Building Construction (Billions 1972 Dollars)	22	21	21	22
Housing Starts (Million Units)	1.6	1.7	2.0	2.1
Domestic New Car Sales (Million Units)	8.4	8.2	8.6	9.7
Consumer Durable Goods (Billions 1972 Dollars)	145	146	152	185
Consumer Durable Goods (Exc. Auto) (Billions 1972 Dollars)	86	86	90	111
Consumer Non-Durable Goods (Billion 1972 Dollars)	345	347	359	395

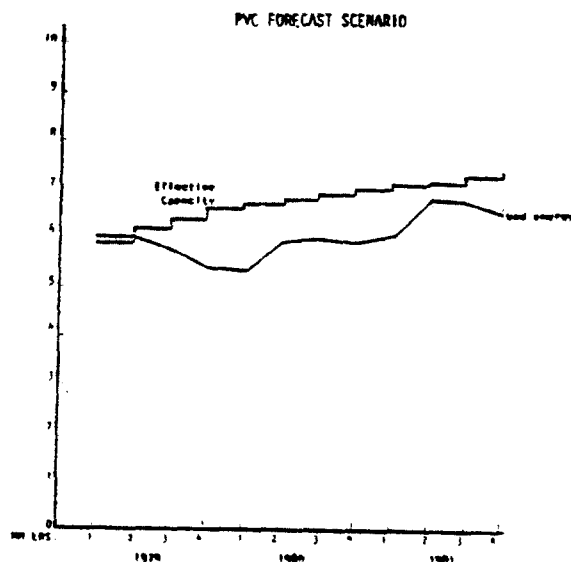
The principal growth of PVC in the construction market will be realized from its cost/performance advantages over clay sewer pipe, ductile iron water service pipe and aluminum siding and windows. The high growth anticipated for PVC automotive undercoating will more than compensate for its decline in automotive seating. Maturing markets such as household, consumer, & wire & cable are expected to track general economic growth. PVC packaging is believed to have overcome some of its health scare problems and some growth should be apparent in the non-food bottle segment.

Reflecting a slowdown in the rate of PVC growth in view of new capacity additions, the effective capacity utilization rate in 1980 is estimated to be 87%. Over the next three years (1980-82) it is projected that approximately 1.89 billion lbs. of effective capacity additions will be realized to meet demand of 1.39 billion lbs. - resulting in an average effective capacity utilization rate of 90%. The table below illustrates the percent effective capacity utilization we are anticipating during this period.

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
PVC Demand (Bil. Lbs.)	5.98	6.20	6.89	7.37
PVC (Effective) Capacity (Bil. Lbs.)	6.43	7.11	7.45	8.32
PVC (Effective) Capacity Utilization (%)	93	87	93	89
VCM (Effective) Capacity Utilization (%)	97	92	94	90

Effective capacity has historically been defined as 90% of nameplate. However, compliance with EPA regulations reduced this to only 85% in 1978. We expect gradual recovery of this lost capacity returning to 90% by 1980.

While there is a fair amount of economic uncertainty during the 1979-1982 time, even the most pessimistic projections show market growth. This is due to PVC's increased penetration of construction markets, replacing steel and aluminums. The graph below is a quarterly forecast based on the DRI base case scenario with CONOCO's PVC model superimposed on their macroeconomic projections. This model shows a significant decline in percentage capacity utilization through the first quarter of 1980, followed by a strong upswing driven by the macroeconomic and seasonal recovery which overlap during the second and third quarters of 1980.



With the effective PVC capacity at less than 90% in 1980, we are projecting a "loose" to in balance PVC market with severe competition during the first quarter. The competitive pressure may be mitigated somewhat by the opportunities to move volume offshore at attractive prices. While export prices may continue to hold up due to the substantial differential between U.S. and foreign feedstock costs, we are projecting the overcapacity in the U.S. to increase competition in these markets as well.

To meet the projected growth in demand over this period, significant changes are occurring in the basic structure of the industry itself. The oil embargo of 1973, the continued rapid escalation in petroleum prices and crude oil shortages demonstrated the importance of feedstock security, while escalating capital costs make that security less achievable. These high capital costs combined with the enormous expense in finding solutions to the VCM health problems forced most vinyl producers to choose between either upstream integration to chemical feedstocks or downstream orientation toward fabricated products. Those companies who have made the choice to integrate upstream will be our principal competition for the growing merchant market.

Rather than having a basic position in hydrocarbons, our primary competitors are integrated upstream to chlor-alkali plants. As the low growth in chlorine demand is currently limiting the production of these units, companies such as Georgia-Pacific and Diamond Shamrock have found it attractive to forward integrate into VCM and PVC as the only expanding outlet for chlorine. CONOCO is in a unique position as the only PVC producer with a strong basic ethylene position. While chlorine is an important feedstock (.60 lb/lb/ VCM), it represents only about 27% of the raw material cost, and only 13% of PVC's sales price. In contrast ethylene represents over 30% of PVC's final selling price. Our ability to purchase chlorine at favorable prices available in an oversupplied market combined with our ethylene feedstock strength should place us in a favorable competitive position over the next several years.

While the chlorine producers will make formidable competitors, as they look to vinyl as their major outlet, the overall long-term effect of their growth participation will be mostly beneficial as:

- 1) The perceived need for this upstream integration in order to be successful in the resin business and the associated capital requirements will discourage new entrants.
- 2) PVC consumers will become more aware that the security of feedstock supply is a major benefit in doing business with an integrated supplier. This should improve our position.
- 3) There will be greater dependence by our competitors on the pipe market for the volumes which are required to achieve production efficiencies and economies of scale. While increasing competition this will help to stabilize pipe as a prime market rather than its previous status as a "place to move incremental volumes at incremental prices".

Several foreign competitors including ICI, Huels and Formosa Plastics have been eyeing the U.S. market for some time. While entry of one or more of these producers is certainly possible, capital, marketing and environmental hurdles have thus far been too great to overcome.

Operating Plan

Sales volumes will move into four principal markets: pipe, calendering, wire and cable and rigid profile. A breakdown of the amount of resin equivalent sales moved into the markets and our expected market shares are shown below:

	<u>1979</u>		<u>1980</u>		<u>1981</u>		<u>1982</u>		
	<u>Volume</u>	<u>Market Share</u>	<u>Volume</u>	<u>Market Share</u>	<u>Volume</u>	<u>Market Share</u>	<u>Volume</u>	<u>Market Share</u>	
Pipe	375	18.8	372	18.6	423	18.5	487	18.7	
Calendering	50	15.5	49	15.5	52	15.5	55	15.5	
Wire and Cable	49	12.6	56	13.3	64	15.0	74	15.5	
Profiles	15	6.3	20	8.5	37	14.2	68	15.0	
Export	12	8.0	13	6.4	25	9.0	25	9.0	
Other	42	5.5	40	5.5	40	5.5	41	6.0	
	<u>543</u>	<u>15.1</u>	<u>550</u>	<u>15.2</u>	<u>640</u>	<u>15.8</u>	<u>750</u>	<u>16.0</u>	-

Our PVC plants will need to operate at maximum rates throughout this period to meet the projected sales/demand volumes with outside resin purchases commencing in 1982 as we begin to build volume for the grass roots plant.

For the period 1979 to 1982, we plan to have the following operating volumes (MM lbs.):

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
PVC Resin Sales	453	488	561	648
Dry Blend Sales	45	28	42	60
Compound Sales	56	60	68	77
Resin Equivalent Sales	543	550	640	750
Total Production	533	550	653	721
To/(From) Inventory	(5)	-	13	(4)
Toll Process/Purchase	5	-	-	25

Investment Plans

To accomplish the goals set forth in the long range plan, several major investments in PVC and derivative products will need to be committed during the time period covered by this operating plan. These investments, timing and capital required are as follows:

	<u>Commitment Date</u>	<u>Start Up</u>	<u>Projected Capital, \$MM</u>	<u>Capacity MM lbs.</u>
PVC Expansion - Aberdeen	1979	1981	13.0	120
PVC Expansion - Oklahoma City	1979	1981	4.1	44
Compound Expansion	1980	1981	2.5	10
Compound Expansion	1982	1983	4.5	25
PVC - Grass Roots Lake Charles	1981	1984	55.0	300
ABD & OKC Debottleneck	1982	1983	2.0	36
PVC Dry Blend Lake Charles	1982	1984	4.0	45

In addition to these major projects, a variety of stream factor improvement, EPA/ OSHA, energy conservation and safety projects will be implemented during this period. Projections of the capital required are as follows:

	<u>1980</u>	<u>\$MM 1981</u>	<u>1982</u>
Oklahoma City			
Large Defined Projects	.4	.8	1.0
Staying in Business (Small Projects)	1.2	.8	.9
Aberdeen			
Large Defined Projects	6.2	1.6	4.9
Staying in Business (Small Projects)	1.1	2.0	2.5
Total Capital	8.9	5.2	9.3
Potential Projects (EPA)			
Oklahoma City	-	7.6	8.3
Aberdeen	-	16.8	18.0

Profit Objectives

	<u>1980</u>	<u>1981</u>	<u>1982</u>
Gross Margin			
Resin	31,052	40,953	52,488
Dry Blend	2,448	4,284	6,600
Compound	7,812	8,883	10,059
Plant Fixed Cost	21,320	26,124	30,182
Business Area Expenses	7,191	7,200	8,000
Pre Tax Contribution	12,916	20,796	30,965

PVC RESIN BUSINESS SUMMARY

Over the past five years, CONOCO has increased its position from the ninth largest producer of PVC resin to its current position as the second largest supplier to the merchant market. This was accomplished through the economic advantage of our large reactor technology, integrated feedstock position and improved marketing capabilities. The major theme of the 1980 operating strategy will be to capitalize on our market and technological position to increase our industry position still further. This will be accomplished through positioning ourselves in high growth markets and an aggressive investment program.

Business Strategy

Our overall business strategy will be to maintain our 15.5% of the merchant PVC market. In 1979, 76% of CONOCO resin sales will go into the pipe market. While this places us in an excellent position to capitalize on this high growth market, further diversification is necessary. Our rationale is that:

- 1) Less dependence on any one market will reduce the impact of a significant economic downturn, technical obsolescence, or government regulations limiting PVC's use.
- 2) A more balanced annual sales pattern would result from further diversification.
- 3) Non-pipe markets generally are less competitive yielding higher prices and margins under more secure arrangements.
- 4) Participation in several of our competitor's major markets acts as a deterrent to severe pricing activity in our major market - pipe.
- 5) Our current high market share in pipe will make increased penetration difficult. Conversely, we should be successful in obtaining a reasonable (15%) position in those markets where our participation is currently insignificant.

Our marketing goals for the next three years will be to maintain our leading position in the pipe and calendering markets with incremental production volumes being directed into the wire and cable and rigid profile markets. Incremental production will result from the startup of 164 MM lbs. of added capacity in 1981 along with a 1981 budget submittal for a new 300 MM lbs./yr. grass roots plant scheduled for startup in 1984.

The volumes for 1980 assume both Aberdeen and Oklahoma City operating at peak production rates with the 5.0 MM lbs. 1979 budgeted debottlenecking project in operation at Aberdeen. 1980 sales are controlled to match production with a reduction in dry blend sales offset by increased sales in compound and resin.

Increased resin production in 1981 and 1982 reflect the startup of the Oklahoma City and Aberdeen expansion projects scheduled for the 1st and 2nd quarters of 1981 respectively. Sales for all three product areas are projected to increase to handle the increased production. In 1981, we plan to replenish inventories that were depleted in 1979 when we suffered production problems early in the year. The 10.0 MM lb.

increase in inventory will provide for approximately 25 MM lbs. of resin equivalent inventory which is roughly equivalent to 14 days of sales. In 1982 we plan to take seven MM lbs. from inventory while purchasing an additional 25 MM for resale.

Feedstocks

VCM feedstock requirements for 1980 will be 560 MM lbs. increasing to 730 MM lbs. in 1982 when the Aberdeen and Oklahoma City expansions are fully operational. CONOCO's supply and demand balance for VCM for the next four years is as follows:

<u>Supply, MM lbs.</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
CONOCO Production	670	675	670	670
UNIROYAL TOLL	10	15	15	15
Purchases	<u>230</u>	<u>112</u>	<u>100</u>	<u>-</u>
Total	910	792	785	685

Demand, MM lbs.

CONOCO PVC Plants	530	560	666	735
Customers	<u>270</u>	<u>222</u>	<u>204</u>	<u>-</u>
Total	900	782	870	735
Surplus (Shortfall)	10	10	(85)	(50)

The above balance shows that CONOCO has sufficient VCM supplies for captive production of PVC at least through 1980. The shortfalls shown in 1981/1982 will be covered by additional purchases from Uniroyal Ethyl or PPG in 1981 and extending the Diamond Shamrock VCM toll arrangement (100 MM lbs./yr.) through 1983. We will also pursue additional VCM purchases to maintain some degree of merchant market activity or to toll into PVC and, in turn, establish positions in the PVC market. PPG and Georgia Pacific will be bringing new VCM capacity on stream in late 1981, and thus there do appear to be sufficient purchase opportunities. The VCM for the Lake Charles grass roots PVC plant, scheduled to start up in late 1983, will come from a 300 MM lb. VCM expansion on the same site.

Strengths and Weaknesses

CONOCO is one of the few companies having 100% of the more efficient large reactor technologies in its plants. The industry as a whole only has 45% of its production coming from large reactors. Over the next ten years conversions to large reactor technology should continue with total increased capacity additions of about 3.1 billion pounds. The remaining 6.3 billion pounds required to meet the projected 1991 demand will need to come from more capital intensive grass roots plants. CONOCO's PVC technology is thought to provide the following cost savings over other commercially available large reactor technologies.

	<u>CONOCO Technology</u>	<u>Other Technology</u>	<u>CONOCO Advantage</u>
Capital Costs c/lb.	2.2	2.6	.4
Manufacturing Fixed Costs \$/lb.	2.1	3.3	1.2

Late this year and early next year, Firestone and Georgia Pacific will be increasing production capacity by 350 MM lbs. This additional capacity comes on stream in 1980 when we are projecting a 3.8% growth in resin demand. While this represents less than

a 5% increase in total capacity, the weakening economic outlook for 1980 may result in overly aggressive pricing policies on the part of these producers.

The EPA's proposed standard requiring further reductions in VCM emissions is still on hold. This will probably not be finalized until an overall carcinogenic substance policy is formalized by that agency. The revised standard could require additional capital for compliance. However, nothing in the 1979 expansion projects is counterproductive in meeting these potential standards, nor does the new increment of capacity bear any larger pollutant load than our current production. The larger base load production volume realized when this expansion increment is added to our existing capacity will further distribute and dilute the effects of future capital investments for environmental reasons.

Product Volume

Resin production, as well as sales and internal consumption during the period 1979-1982 are projected as follows:

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Resin Production	534	550	653	721
Internal Consumption				
R. E. Compound	29	36	41	46
R. E. Dry Blend	41	26	38	56
Resin Sales	475	488	561	648
Outside Purchases	<u>5</u>	<u>-</u>	<u>-</u>	<u>25</u>
	(6)	-	13	(4)

Product Pricing Strategy by Major Markets

Pipe Market

In 1979, discounts were prevalent in the pipe resin market with the industry evolving into a three tier pricing structure:

- 1) Small customers purchasing 10-20 MM lbs./yr. received a 1¢/lb. discount.
- 2) Medium sized customers purchasing 30-50 MM lbs./yr. received a 1.5¢/lb. discount.
- 3) Large customers purchasing in excess of 70 MM lbs. were receiving discounts ranging from 1.5¢/lb. to over 2¢/lb. One of the largest pipe producers was reported to have a 10% discount from a major supplier, which would provide a 3¢/lb. discount during the summer of 1979.

In late 1978, CONOCO introduced a volume rebate program for all contract pipe customers, regardless of size. Essentially this program established a 1¢/lb. yearly rebate which was tied to the customer's purchasing volumes equal to, or greater than, the contract maximums.

With the tight 1979 market conditions still fresh in the PVC supplier's mind, 1980 will provide an atmosphere conducive to narrowing the differentials and overall depth of the discounts. However, there are at least two large pipe producers who have contracts through 1980 which provide discounts equal to or greater than 1.5¢/lb. which will adversely affect our ability to reduce our discounts. Another factor will be demand. Should the market remain tight through the third quarter of 1979, when most of the 1980 contracts will be negotiated, the potential for reducing the discounts is good. Should demand drop sharply during this period, our competitors will become much more aggressive in their 1980 contract proposals.

CONOCO's strategy will be to attempt to lead the market in reducing the differentials by establishing in contract negotiations that we will only grant a 1¢/lb. discount and that would be for all pipe customers. It is thought that completely eliminating discounts would prove psychologically unacceptable to pipe customers who have historically had some type of discount. To completely eliminate the discount differentials in one year is also overly optimistic and as a result we have budgeted an average 1980 pipe discount of 1.3¢/lb.

Wire & Cable Market

We plan to continue our resin diversification program in the 1980-1982 time period and as a result have elected to continue the "wire & cable" and "calendering" programs in 1980. The wire & cable programs instituted in the fourth quarter of 1978 provided a pricing mechanism which establishes the selling price for resin sold into this market at 1¢/lb. over the pipe resin market price. This pricing mechanism provides the wire & cable producer with a significant saving. Since pipe resin is sold at a discount ranging from 2-3¢/lb. over pipe resin. The objective of the wire & cable program is to increase CONOCO's market share in this industry from 5.5% in 1978 to 15% by 1981 to match our overall position in the merchant market.

Calendering Market

The calendering program which was also instituted in 1978, establishes the selling price for calendering grade resin the same as the pipe grade market price. Since there are no discounts involved, the program still provides a 1-2¢/lb. differential over pipe resin. Although the quality constraints are slightly higher as compared to pipe grade resin, associated production costs are estimated to be less than 0.5¢/lb.

The objective of the calendering program is to increase CONOCO's market share to 15% of the market by 1981. We essentially accomplished this objective in 1979 when we increased our market share from 11.9% in 1978 to 17%. Our plans are to maintain this position throughout the 1980-1982 time period with some realignment as dictated by customer long term viability.

We plan to continue the calendering pricing mechanism through 1980-1982 time frame for the following reasons:

- 1) Netbacks are still higher as compared to our other alternative, i.e. the pipe market.
- 2) Help protect merchant resin calenders from integrated calenders and therefore maintain the size of merchant calendering market.

- 3) The pricing program formalizes what the large calendering customers have in actuality been obtaining, i.e. over a period of time prices have equalized with the pipe market.
- 4) One of the original justifications for the diversification program was to combat the flexible resin marketers when they move incremental resin into the pipe markets during long supply periods at distressed prices. With the calendering and wire & cable programs, prices escalate or de-escalate in the flexible market with pipe prices and hopefully will influence the future marketing activities of the "flexible" resin producer.

Export Market

We plan to continue exporting limited quantities of resin during the 1980-1982 time period. Volumes are projected to increase from 13MM lbs. in 1980 to 3.5% of our production volume in 1982 (25 MM lbs.). Export netbacks are assumed to be equivalent to domestic pipe customer netbacks. Historically, export netbacks have fluctuated dependent on world economic conditions and in general have been less than domestic netbacks. However, in 1979, netbacks increased dramatically and currently are running 34-36¢/lb. or 4-6¢/lb. above domestic netbacks. Whether the netbacks return to historical levels is a matter of world economics. In our current Three Year Plan we have elected to be conservative by assuming netbacks will be equivalent to domestic pipe prices. We will attempt to maintain enough flexibility in our plan to double the volume available for export should prices continue to exceed domestic levels. (Anticipated resin net backs are shown in table 1.)

Marketing Strategy

In 1979 a major product diversification program was instituted to reduce our dependence on the pipe market. Our principal motives for diversifying into other markets were:

- 1) Provide higher netbacks (partially offset by production penalties).
- 2) Opportunities for market penetration through use of our broad resin, compound and plasticizer line which has proven attractive to customers.
- 3) More market balance with less vulnerability to a turndown in any one segment.
- 4) A moderate position should give us some additional leverage on competitors who participate in these higher netback markets but who periodically use price excursions in the pipe arena to move incremental resin.

The objective of the program was to reduce the percentage of our sales to the pipe market from 78% in 1978 to 65% by 1981. The first phase of this program was to increase our market share in the older more established wire and cable and calendering markets from 5% in 1978 to 15% by 1981. This phase of the program has been successful with 1979 market shares increasing to 8% in wire and cable and 17% in calendering markets. Additional penetration into the wire and cable market could have been realized had additional volumes been available.

Our program for 1980-1982 will be to further penetrate the wire and cable market with most of the penetration occurring in the 1980 time frame. Our strategy will be to increase our participation at existing accounts while at the same time adding several additional large volume accounts, i.e. General Electric, Western Electric, Anaconda and Phelps Dodge. We plan to continue at least through 1980 with the "wire and cable" program (see pricing strategies) which was instituted in late 1978. This program has proved to be a valuable marketing tool and should allow us to gain the desired penetration. Although we are planning on continuation, the program will be re-evaluated again in 1980 to determine if it is desirable for 1981.

In the calendering market, we intend to hold our current position with some realigning depending on long term customer viability. We also plan to continue the "calendering pricing" program (see pricing strategy) in 1980 as this provides market stability.

The second phase of our diversification program will involve the development of a leading position in the vinyl siding and profile markets. We plan to utilize dry blend as the leading edge in this market (see dry blend section).

Our plan also incorporates a modest increase in export volume from 13MM lbs. in 1981 to 25MM lbs. by 1982. With this limited volume we plan to maintain a presence in New Zealand, China and South America while beginning to develop opportunities in the mediteranean and African countries. Unless prices continue at levels substantially above the U. S. domestic alternative, Conoco's 2.5¢ inbound freight disadvantage to Gulf Coast producers will make further expansions of export markets unattractive. This will change in 1984 when our Lake Charles plant will be in operation. We would then plan to increase their volumes to 7% of our total volume or 75MM lbs./year.

Resin sales volumes for 1980-1982 are forecasted by principal markets as follows:

	Resin Sales, MM Lbs.			
	1979	1980	1981	1982
Pipe & Fittings	359	341	393	447
Calendering	50	56	57	61
Wire & Cable	22	39	44	50
Rigid Profiles (siding & windows)	11	20	35	50
Other	9	10	10	10
Off-grade	4	4	5	5
Export	20	13	25	25
Total Resin	475	488	561	648

Increased sales in 1980 results from both Aberdeen and Oklahoma City operating at budgeted production rates. Increased volumes into the wire and cable and rigid profile markets are realized at the expense of the pipe and fittings area. The 1979 sales volume of 359 MM lbs. into the pipe and fittings market reflects the first quarter allocation program which resulted from cold weather related production problems. The actual 1979 contract plus historical committed volumes was 376 MM lbs. The 1980 volume of 341 MM lbs., therefore, reflects a reduction of 35 MM lbs.

In the pipe and fittings market we plan some realignment with our objective to position ourselves with the major pipe producers for growth in 1981 and 1982. The majority of the volumes for continuing our realignment program will come from reduced commitments at Simpson and Carlon. We are negotiating with

Simpson to reduce our commitment from 68 MM lbs. in 1979 to 50 MM lbs. in 1980. Simpson has indicated a willingness to such a reduction as they are interested in securing a second supplier. Carlon's reduction from 144 MM lbs. in 1979 to 100 MM lbs. in 1980 will be more difficult as our long term contract does not expire until 1981.

In addition to the Simpson and Carlon reductions, we plan several other minor realignments in 1980. The principal addition to the 1980 pipe customer portfolio is Cantex. Until 1979 Cantex was the largest purchaser of dry blend at approximately 75 MM lbs./yr. In 1979, Cantex purchased three additional plants and started up blending units in their existing two plants which moved them to the number five pipe producer at 200 MM lbs./yr. We gained a supply position in 1979 with Cantex utilizing dry blend and plan to convert this into resin volume in 1980. With the addition of Cantex to our customer portfolio, we will be doing significant business with three of the five major pipe producers, i.e. Carlon, CertainTeed and Cantex. We have made inroads at Johns-Manville in 1978-1979 and could conceivably obtain business at this account in 1980 if product were available. Our current strategy is to secure a position with the other two major pipe producers, Johns-Manville in 1981 and Robintech in 1982, when additional volumes become available. This pipe resin marketing program will give us a stronger base of customers with less dependence on any single account while at the same time providing a good base for growth during the 1980's.

Manufacturing Strategy

We plan to operate both plants at maximum production rates throughout the three year plan.

	<u>1980</u>	<u>1981</u>	<u>1982</u>
Aberdeen	335	403	460
Oklahoma City	<u>215</u>	<u>250</u>	<u>261</u>
	550	653	721

Due to the seasonal cyclicalilty of our business, we plan to build inventory in the first and fourth quarters and pull inventory during the third and fourth quarters. Historically, the demand for the first and fourth quarters has been approximately 90% of the average with the second and third quarters at 110%. Our operating procedure will be to bag the yearly forecasted domestic and export bag shipments plus the required inventory buildup to allow both plants to operate at maximum production rates during the third and fourth quarters.

The following table summarizes our bagging/debagging requirements for the 1980-1982 time period:

	<u>1980</u>	<u>1981</u>	<u>1982</u>
Bagging Rates 1st & 4th/qtr., MM lbs./Month	8	-	5
Projected Yearly Bag Sales, MM lbs./Year	16	28	28
Debagging Requirement, MM lbs./Yr.	-	2	-

Debagging requirements are projected to be minized in 1981-1982 time period due to projected heavy export shipments. While the strategy of bagging and debagging sounds inefficient, the cost equivalent of \$.015/lb. PVC would not yield an attractive return on bulk storage. As the resin price in the second and third quarter has historically been over \$.02/lb. greater than the first quarter, this procedure is probably more attractive than pursuit of higher sales volumes in the first and fourth quarters.

Shown below are the 1981 and 82 quantitative stretch objectives with 1980 at budget.

Aberdeen

	1980	1981	1982
Resin production MM lb.	335	403	460
Yield lb. VCM/ lb. PVC	1.02	1.02	1.015
Stream Factor %	91.2	91.2	93

Oklahoma City

Resin production MM lbs.	215	258	269
Stream factor %	92	92.7	93

Major projects will include

Aberdeen

1. Plant expansion on stream 2nd quarter 1981
2. Post expansion debottleneck on stream 1st quarter 1983
3. VCM/PVC yield improvement
4. Stream factor improvement
5. EPA revisions - stream strip to 100 PPM
6. EPA solid waste water and irritant resolution

Oklahoma City

1. Plant expansion on stream 1st quarter 1981
2. Post expansion debottleneck on stream 1st quarter 1983
3. Stream factor improvement
4. Solid waste disposal, PVC emission reduction
5. EPA revisions - stream strip to 100 PPM

R&D Strategy

Research and Development work will continue on resin quality improvement and capacity optimization. Work will also continue on increasing our basic understanding of the chemical and physical structure of the PVC polymer.

Current plans call for the shutdown of the PVC of pilot plant in October 1980. This move will reduce R&D expenses by approximately \$600M per year. We anticipate a need for the pilot plant again in 1983 to provide additional testing for new improvement ideas generated in R&D during 1981-1982 time period. The future mode of operation for the pilot plant will be to shut the unit down for a 1-2 year period and then return it to operation once sufficient basic research projects have been identified to keep the unit operating for at least a one year period.

Major R&D projects for the three year period are as follows:

1. Optimize steam stripping model
2. Peaked resin particle size
3. Improved dry time control
4. Continued improvement in Productivity
5. Develop a resin or resin formulation technique which will provide our customers with a 5-10% processing advantage.

The above goals assume that there will be no deterioration from current productivity and quality.

Expansions

Current plans call for the expansion of our Oklahoma City and Aberdeen plants by 44MM lbs. and 120MM lbs. respectively. The expansion projects are projected to start up in the first quarter and second quarter of 1981 with the Oklahoma City expansion coming on stream first. The following capacity over the next ten years:

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
Base, MM lbs./yr.	550	550	550	550	550	550	550	550	550	550
Aberdeen Exp.	-	-	68	120	120	120	120	120	120	120
OKC. Exp.	-	-	35	44	44	44	44	44	44	44
OKC/ABD Debott.	-	-	-	-	36	36	36	36	36	36
Grass Roots Plant	-	-	-	-	-	200	300	300	300	300
Grass Roots Exp.	-	-	-	-	-	-	-	-	200	300
Total	<u>550</u>	<u>550</u>	<u>653</u>	<u>714</u>	<u>750</u>	<u>950</u>	<u>1050</u>	<u>1050</u>	<u>1250</u>	<u>1350</u>

With this expansion program, we will increase our share of the merchant PVC market from the current 15% to 18% by 1988.

To implement the above program will require 1981 budget submittal of the new grass roots plan, a minor debottlenecking project at Aberdeen and Oklahoma City would then be submitted in the 1982 budget. The minor debottlenecking project is as yet undefined but should become apparent when the expansion projects come on stream in early 1981. Engineering designs and estimates for the grass roots plant should be ready for budget submittal in August 1981.

<u>Profit Objectives</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Volume MM lbs.	488	561	648
Net back price ¢/lb.	27.7	28.8	32.1
Margin ¢/lb.	6.4	7.3	8.1
Margin \$ MM	31.052	40.953	52,488
Fixed Cost allocated \$M	15,817	19,530	22,344
Contribution before BA expense	15,235	21,423	30,144

Table 1
Resin Netbacks for 1980-82

	<u>1979 Budget</u>	<u>1979 Reforecast</u>	<u>1980 Budget</u>	<u>1981 Projection</u>	<u>1982 Projection</u>
Pipe Market Price	24.0		29.9	36.0	40.0
Discounts	1.7		1.3	1.0	1.0
Freight	1.1		1.2	1.4	1.5
Netback	<u>21.2</u>	—	<u>27.4</u>	<u>33.7</u>	<u>37.5</u>
Wire & Cable Market Price	n/a		30.9	37.0	41.0
Freight	n/a		1.1	1.2	1.3
Netback	<u>n/a</u>	—	<u>29.8</u>	<u>35.8</u>	<u>39.7</u>
Calendering Market Price	n/a		19.1	36.0	40.0
Freight	n/a		1.4	1.5	1.6
Netback	<u>n/a</u>	—	<u>28.2</u>	<u>34.5</u>	<u>39.4</u>
Rigid Profiles Mkt. Price	n/a		29.9	36.0	40.0
Discounts	n/a		1.0	1.0	1.0
Freight	n/a		1.1	1.2	1.3
Netback	<u>n/a</u>	—	<u>27.8</u>	<u>33.8</u>	<u>37.3</u>
Export Netbacks	17.0		26.0	33.0	36.5
Off-grade Netbacks			14.0	15.0	16.0
Wt. Avg. Netbacks	21.5	25.5	27.7	33.9	37.9
Variable Costs	15.8		21.3	26.6	29.8
Average Gross Margins	5.8		6.4	7.3	8.1

VINYL DRY BLEND BUSINESS SUMMARYBackground

In 1968 CONOCO began production of pipe dry blend in Aberdeen, Mississippi to supplement Carlon's blending capacity. Although minor quantities were sold to the outside, no real effort was made to enter the merchant market until CONOCO sold Carlon in 1972. From that date, CONOCO began to develop a merchant business for these products. The market tightness of 1973 and 1974 aided this development and by early 1974 we were operating at capacity of 37 MM pounds. The dry blend unit was debottlenecked in 1976 to 45 MM pounds, to 51 MM pounds in 1977 and then expanded again reaching 77 MM pounds in July of 1978.

This business has been a strategic part of our overall vinyl marketing plan allowing us to participate at accounts which were not large enough to do their compounding. Many of these accounts have subsequently grown to the point where installation of their own blending equipment became attractive, thereby, converting from a CONOCO dry blend to CONOCO PVC resin customer.

Business Strategy

Our business strategy will be two pronged. First to retard the erosion of our dry blend volume to current pipe customers, and second to develop a substantial rigid profile business.

Dry blend sales volumes will decline from 56 MM lbs. in 1978 to less than 50 MM lbs. in 1979. This is principally due to conversion of several major dry blend customers to doing their own blending. This trend is expected to continue with sales to pipe and pipe fitting customers reaching a low of 28 MM lbs. by 1980. While there are other pipe dry blend accounts which could be obtained to replace those who have either converted or will convert to resin, this is undesirable as:

- 1) Most potential new accounts are small pipe producers with questionable financial stability.
- 2) Sale of resin to develop prime resin accounts in wire and cable and siding markets is more desirable.
- 3) Any new accounts would be obtained at Diamond's expense putting added pressure on margins.

We will therefore continue our current strategy of maintaining pipe business until producers economics warrant conversion. We will attempt to retain those customers whose long term purchases of dry blend make sense through development of lower cost pipe formulas and continued technical service.

The major thrust will be toward developing a rigid profile dry blend business. This market which includes window and door frames, vinyl siding and special

molding is expected to grow to 430 MM lbs. by 1982 and 730 MM lbs. by 1988. Our strategy will be to use dry blend as the leading edge to developing these markets. This will give CONOCO the following advantages:

- 1) The only alternative to in-house compounding of profile formulations currently offered is the purchase of vinyl pellets. However, these pellets are expensive while the alternative of compounding requires large volume consumption to be economical. Purchase of CONOCO's dry blend will allow a customer to begin small with a formulated product but without a large competitive disadvantage.
- 2) CONOCO has developed an expertise in rigid formulations through past pipe and siding work with a number of different customers.
- 3) Siding and window profile formulation require three years of favorable weathering data to be acceptable. Once CONOCO is approved this will give us a substantial lead over our competitors and make substitution more difficult.

Strengths and Weaknesses

Through the efforts of our Plastics Applications Laboratory, we have developed both single and multi-screw pipe dry blends which are superior in performance to those of our competition. This has allowed us to increase our share of the dry blend pipe market at the expense of Diamond Shamrock, who is the only other significant producer of pipe dry blends for the merchant market.

As always, the greatest threat to our dry blend business is the conversion of our customers to in-house blending as they grow in size.

Industry Conditions

The total merchant dry blend market is 200-300 MM lbs. of which approximately 80-90% is pipe dry blend. The total merchant market will likely remain constant over the next few years, but the makeup of this will shift. The percentage of pipe dry blend will shrink and be replaced by the growth in pipe fittings, siding and other profile dry blend.

The profile market is expected to grow at the rate of 13% per year reaching 730 MM pounds by 1988. Its ultimate potential could be in the range of 2-4 MM pounds. Vinyl siding volume should reach 300 MM lbs. by 1982 with window and door frame usage exceeding 100 MM lbs. by that date. This rapid growth is driven by the difference in energy requirements to make aluminum versus vinyl, combined with vinyl's superior insulation properties.

Household siding has historically been supplied by the large aluminum, steel and building supply companies. With the advent of lower cost vinyl siding this is changing. Companies like Bird & Sons, Mastic, Vipco and Gold Bond are entering the business, as well as the steel and aluminum companies who recognize that it's only a matter of time until vinyl dominates the industry. As with any new plastics market, we expect to see a large number of new

companies entering the field, many with little or no expertise in processing vinyl. They will require a great deal of technical service. Producers will therefore respond well to those suppliers with expertise willing to offer them help. By the very nature of the distribution outlets and promotional requirements, these customers will be large volume producers who eventually compound their own resin.

The door and window frame market is projected to develop much differently. There are over 10,000 window fabricators in the United States, many of whom extrude aluminum from purchased ingot and sell to a local market. As the cost and performance advantage of vinyl are made known these fabricators will either purchase profiles from someone like CertainTeed or put in their own plastics extrusion equipment. The larger window manufacturers would individually probably consume 8-10 MM pounds of dry blend and may be hard pressed to justify conversion to resin at these volume levels.

Product Pricing Strategy

Our pricing strategy for pipe and pipe fittings market will be to charge resin market price plus a conversion fee which recovers our costs and is adequate to obtain a 15% return on a capital replacement cost basis.

Profiles will be priced in a similar fashion. However, to the base price we will also add a charge to cover our development costs which we estimate to be equivalent to \$.05/lb. This will still give our customers a cost advantage of \$.05-\$.10/lb. over pellets using our current 'weather proven' formula and potentially greater than \$.10/lb. on newer development formulations.

Marketing Strategy

We will continue our successful strategy of offering the top performing pipe dry blends to the pipe industry. In addition, as indicated in the pricing section, we plan to attempt to price our product in such a manner that we do not encourage the shrinking of the dry blend pipe market. This will be done by maintaining an upcharge over resin equivalent to a 15% return on a grass roots major scale dry blend unit. We will continue our efforts in formulation cost reduction to help us in this endeavor. However, when a dry blend customer has finally reached the size and has made the philosophical commitment to convert to in-house blending, we will assist them and to do so hopefully converting them to a loyal resin customer. Our dry blend business has been an important source of resin customers and should continue to be so in the future.

The structure of the vinyl siding industry would appear to be quite similar to that of pipe with most producers eventually having in-house blending facilities. However, as with pipe, vinyl siding dry blends will offer CONOCO interim opportunities with new entrants until they reach a size where in-house blending is economically feasible. To date, neither Diamond nor Goodrich have promoted the dry blend concept. This has undoubtedly kept the smaller potential entrants out of the market, as to compete using pellets would be

prohibitive. The window frame and door market offer similar opportunities for us. However, the industry structure should be quite different than the larger fabricators, with the largest producer only consuming about 8-10 MM pounds per year. This suggests that a long term dry blend potential may exist. With weathering requirements, formulation expertise, and capital hurdles, there would be little incentive for these producers to dry blend their own formulations, and there will be few competitors who can provide the necessary technical assistance.

Our overall strategy for development of the potentially large and profitable siding and window profile markets will be to:

- 1) Offer dry blend with proven weatherability and production history to siding and window manufacturers.
- 2) Develop relationships with machinery manufacturers where mutual promotion of machinery and dry blend is compatible.
- 3) Prepare a promotion package detailing machinery/dry blend window design and operating conditions to assist new entrants.
- 4) Construct a demonstration line for window profiles in Ponca City.
- 5) Develop a direct mail and trade journal advertising program to create an image of technical expertise.

While this approach does have some legal questions on product liability, we believe the attractiveness of the program will outweigh some limited risk. We will need to work with Legal to minimize our exposure.

The timing of the program will be such that the initial promotion would commence during the second quarter of 1980 with the demonstration line available by the fourth quarter of 1980. We would expect to commence sales of siding dry blend by 1981 and window profile dry blend by late 1981 with sales of over 20 MM lbs. to these markets in 1982.

A break down of projected sales by market in MM lbs. is as follows:

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Pipe Dry Blends	42	23	27	27
Fittings Dry Blends	3	5	8	10
Siding Dry Blends	-	-	5	13
Door & Windows Dry Blends	-	-	2	10
	<u>45</u>	<u>28</u>	<u>42</u>	<u>60</u>

Expansions

Additional equipment will be required to handle the higher filler loadings of profile dry blends. It is proposed that we commit \$200 M (A-2) to handle the increased volume of microingredients and install gaylord loading equipment capable of packaging 12 MM lbs./year. This will allow us to produce a mix of profile and pipe dry blends at our rated capacity of 77 MM lbs./year.

Manufacturing Strategy

In 1979, we will produce a total of 45 MM lbs. of dry blend consisting of three different products; a multi-screw pipe dry blend, a single-screw pipe dry blend, and a fittings dry blend. This will increase to include a siding dry blend in 1980, and three window profile formulations by 1981. The total number of products produced should reach a maximum of 8 - 10. The quantity of boxed material should also increase drastically reaching 12 MM pounds by 1982.

R&D Strategy

Work in the pipe area will be primarily limited to evaluation of new microingredients and more efficient low cost formulations.

In pipe fittings, work will continue to improve our formulations, particularly those characteristics which will enable us to move into the larger fitting areas in which we currently have limited ability to replace pellets. In vinyl siding, we will be "fine tuning" our current formulation. The most important technical spect will be analyzing results of our current formulation for weathering data as we begin to get some significant time on the test fences. These formulations will then need to be optimized for maximum extruder output.

The greatest effort will be placed in the rigid profile area in developing formulations to compete with B. F. Goodrich and Ethyl pellets. The primary technical requirement is to develop a product that has similar die swell characteristics to the current pellets offered to the market place, but processes effectively in twin-screw equipment.

The initial development work will be carried out using in place machinery at various European profile producers. Our consultant will help arrange various trial runs, the products from which will be placed on long term weathering studies. We plan to include in the 1980 budget a program to purchase lease extrusion and take-off equipment comparable to a production line plant operation. This would be used for development and demonstration purposes. It should be onstream by the fourth quarter of 1980. A continued effort will be made toward developing lower cost formulations with high weatherability.

Profit Objectives

	<u>1980</u>	<u>1981</u>	<u>1982</u>
Volume (MM lbs.)	28	42	60
Netbacks (¢/lb.)	38.1	39.2	42.6
Margins (¢/lb.)	9.3	10.2	11.0
Margins (\$M)	2,604	4,284	6,600
Fixed Cost (\$M)	1,496	2,086	2,841
Contribution -- Prior to Ba Expense (\$M)	1,108	2,198	3,759
Contribution over Large Pipe Producer Resin Price (\$M)	840	1,638	2,780

FLEXIBLE COMPOUND BUSINESS SUMMARY

CONOCO has been in the PVC flexible compound business since we bought the Aberdeen plant from Thompson Apex in 1964. This plant has been a distinct asset by providing us with incremental profit over resin, market diversification, and a broader product line which has aided our resin marketing program.

The compound operation currently includes two lines, one of which is obsolete and will be closed when the new compound line (approved in April, 1978) comes onstream during the 4th quarter of 1979. These lines are supported by a plasticizer unit with a rated capacity of 25 MM pounds. The compound operation is an integrated system utilizing not only CONOCO's resin but also plasticizers based on CONOCO's ALFOL alcohols. The flexible compound and plasticizer operation provided an incremental pre-tax contribution to gross margin \$4,187M in 1978 and is projected to contribute \$5,200M in 1979.

Compound sales volumes improved in 1978 from the 1977 sales level of 29.8MM pounds to a 1978 total of 42.7 MM pounds. Sales for 1979 have continued to improve to the annualized level of 46.0 MM pounds per year. Sales levels of 60 MM pounds/year are planned for 1980 with growth beyond 65 MM pounds limited by currently installed capacity.

Market Outlook

The PVC pelletized compound market (flexible and rigid) is estimated to grow 6%/year from 1.5 billion pounds in 1978 to 1.9 billion pounds in 1982. The market is distributed 80% "flexibles" and 20% "rigids". Rigid pelletized compounds are expected to grow at a higher rate than flexibles.

Market	Flexible Pelletized Compounds MM Lbs. 1978	Rigid Pelletized Compounds MM Lbs. 1978
Wire & Cable	460	-
Shoe Soles	60	-
Misc. Moldings & Extrusions (Flexible)	680	-
Siding	-	60
Window Profiles	-	40
Fittings	-	115
Injection Moldings (Rigid)	-	20
Misc. Profiles (Rigid)	-	65
Total	1200	300
Compounded Annual Growth Rate (1978-88)	5.0%	8.5%

CONOCO presently participates in the flexible pelletized compound market which is expected to grow 5%/year from 1.2 billion pounds in 1978 to 1.5 billion pounds in 1982. Approximately 55% or 660 million pounds of this flexible compound market is supplied by 11 producers who also manufacture PVC resin, the leading companies being B.F. Goodrich, Tenneco, Firestone, CONOCO, and Pantasote, in that order. The remaining 45% of the flexible pelletized compound market (540 million pounds) consists of numerous independent compounders, the largest being Teknor-Apex, Blane and Schulman.

The structure of the flexible pelletized compound market will continue to be in a state of transition. For example, some PVC processors will convert to in-house compounding as they grow to a point where it becomes economically feasible. However, many wire and cable companies purchase compounds needed for specialty end use rather than manufacture the compound end house. These applications plus the establishment of new compound end users will more than compensate for the loss in compound demand due to larger users converting to in-house compounding.

PVC pelleting compounds support CONOCO's PVC business by offering an attractive incremental profit over resin, market diversification (outside of our traditional commodity pipe market) and a "foot in the door" leading to eventual direct sales as resin.

General Business Strategy

In flexible PVC compound, the business strategy will be to grow our share of the 1,200 MM pound per year market from about 3.5% in 1978 to about 6.0% (75 MM pounds/year) by 1982. The initial area of concentration will be in wire and cable end uses where we will place about 50% of our sales. Other areas of concentration will be automotive, the highly profitable profile market and general molding.

In approaching the flexible PVC compound business, plans will be laid which recognize the need to select customers which bring to CONOCO attributes beyond just sales. These reinforcing attributes would support the basic strengths compounds bring the CONOCO. The major strengths are:

- 1) Compound sales, particularly in the wire and cable area, can be the "leading edge" to new resin sales. Many customers in electrical areas purchase both compound and resin. CONOCO's ability to supply both products makes CONOCO a more attractive supplier. Also, as compound customers grow in size, they generally convert to in-house blending. If their compound supplier is also a resin producer, he gets first shot at the resin sales. Likewise, as an "in-house" blender grows, he will purchase incremental compound requirements. Again, his resin supplier gets "first shot" at supplying this compound.
- 2) By producing flexible compound, CONOCO gains flexible blending technology which helps to support our diversification program for resin sales.

- 3) Compounds open up a portion of the merchant flexible resin market (720 MM pounds resin equivalent) which is available only to compound suppliers.
- 4) Compounds diversify sales of resin to non-pipe end use markets. Currently, about 25% of CONOCO's non-pipe sales are through flexible compound.
- 5) Compared with other market alternates, compound sales upgrade the realizations on prime resin, the ALFOL Alcohols used in the plasticizer and some off-grade resins which can be used to produce prime compounds versus off-grade sales at 2-4¢/pound below market.

During the plan period, we will increase our sales from the 1978 level of 42 MM pounds per year to 75 MM pounds per year. Customers will be selected which purchase the larger volume, non-color critical compounds. Special emphasis will be placed on those customers who reinforce our resin programs, and who use more than 2-3 MM pounds per year of compound. Wherever practical, compound will be used as an entree to potential resin accounts; however, in doing so the creation of small volume specialty compounds, often the opening ante, will be held to a minimum.

Pricing Strategy

During the period of this plan, we are projecting an aggressive growth pattern for both compound and plasticizers. With this growth pattern, CONOCO will be a follower, not a leader in increasing prices. We will remain competitive but will not "buy" the volume by being the "low-ball" pricer. In compounds we will formulate to produce materials which are more efficient or of higher quality than our competition. The minor cost involved in this method generally will not be passed onto the customers.

Capital Investments

During the plan period, several capital projects will have to be executed if we are to achieve the planned production levels. Major projects would include:

	<u>Capacity Added</u>	<u>Budget Year</u>	<u>Startup Year</u>
Die Face Cutter, Line III	Efficiency	1980	1981
Bottleneck Removal, Line III	10 MM	1980	1981
New Compound Line A	25 MM	1982	1983

Other minor projects might include tankage to handle a polymeric plasticizer, minor efficiency projects, etc.

Marketing Strategy

In approaching the sales, long-term relationships will be sought with the goal of increasing our sales to 60 MM pounds in 1980 and to 66 MM pounds in 1981 growing to 77 MM pounds in 1982. Customers will be selected which purchase the larger volume non-color critical compounds. Special emphasis will be placed on those customers who purchase both resin and compound. Where every practical, compound will be used as an entree to potential resin accounts, however, in doing so, the creation of small volume specialty compounds will be held to a minimum. Exports will be used as

a balancing account to fill out the production level. An estimate of needs by product is attached.

Current experience indicates that the major compound consumers have long histories with their current compound suppliers making entry difficult. However, generally, the suppliers are smaller companies without the degree of feedstock integration possessed by CONOCO. Our experience to date is that an aggressive compound program by a large integrated supplier is welcomed by the purchasing groups at the larger accounts. Our strategy by Market end use is as follows:

Wire and Cable Market

For CONOCO, the wire and cable industry, which consumes about 460 MM pounds per year of compound, offers a unique compound sales opportunity because it matches so many of our overall goals. First, it is an industry where both resin and compound can be sold to the same accounts. There are a large number of customers who purchase substantial quantities of non-color matched "commodity" type compounds. Also, CONOCO has a product line which can fill most large volume compound needs. During the plan period, in conjunction with our resin wire and cable program, this market will be the major compound growth target.

Currently, CONOCO sells about 25 MM pounds (45% of sales) to the wire and cable industry. We sell 9-11 MM pounds per year to the country's largest compound purchaser, Western Electric, and sell substantial volumes to Northern Electric and American Electrical. These sales represent about 5% of the market and by 1981 we project our market share to be about 7.0%. In achieving this goal, emphasis will be placed on communications, automotive wiring and high specification building product end uses.

Future areas will be increased activities in markets requiring flame retardance and alternate stabilizers to replace the lead based products currently used.

Automotive Market

The automotive market constitutes an end use area which fills two of CONOCO's resin goals. First, companies, or divisions, like Chrysler, Ford, and Packard Electric Division of GM are also major resin buyers and are included in CONOCO's long term resin customer plans. The automotive market consumes large quantities of molding compounds which can be manufactured with off-grade resins. Also, for the PVC compounded internally by the automotive companies, linear plasticizers are the preferred plasticizers.

The automotive market has been identified to be at least 58 MM pounds per year of which about 50% is not available to CONOCO because it requires a "dead" color match product which cannot currently be produced at Aberdeen. This market is supplied by about ten non-integrated compound producers. In 1979 CONOCO will sell about 2.8 MM pounds of compound for automotive end use.

During this plan period, CONOCO's program will be somewhat limited in that major work will be oriented towards obtaining a portion of Packard Electric's (GM) 8.0 MM pounds per year requirement for automotive wiring. Compound approval would open the door to their 15 MM pounds per year resin requirement. Additional emphasis will be placed on obtaining formal approval at Chrysler, Ford, and GM for compounds already developed. Also, the possibility of supplying Chrysler with large volume compounds which they in turn distribute to their custom molders will be explored. Total projected 1980 sales to automotive end use will be about 5.9 MM pounds growing to 8.3 MM pounds in 1981 and 1982.

General Molding Market

General molding applications are attractive to CONOCO because these compounds can use lower quality resins which would have to be sold at a 2-4¢/pound discount below prime grade resins. Molding end uses consume in excess of 200 MM pounds per year of PVC compound of which the largest sector is for shoe soles. TPR (Thermoplastic Rubber) in recent years has made significant inroads into the shoe market and has set new standards for softer, matte finish materials. In 1979, CONOCO will sell 4.0 MM pounds of molding compounds.

With the new compound line coming onstream in the second half of 1979, we will be able to manufacture the softer compounds currently in demand. Our strategy will be to maintain our current domestic shoe business, grow slightly in the higher profit automotive molding compounds, introduce a line of soft shoe and electrical grommet compounds and use the export of shoe compounds to fill out the productive capability of the unit. These moves will allow CONOCO the continued opportunity to move some lower quality resins at prime resin values.

Profile Market

The fastest growing segment of the PVC market is rigid profiles. CONOCO has a program to expand our dry blend sales into this market area.

Presently, CONOCO sells about 7 MM pounds of flexible profile compound to customers who also purchase rigid profile compounds from BFG and Ethyl. These flexible compound sales will give us an established entry point for our programs in rigid profiles. During the plan period, we plan to strengthen this position in the profitable flexible weatherstrip profile market.

The majority of CONOCO's profile sales are to the clear floor protective product market. In 1979, this volume will be 14 MM pounds and primarily, because of contractual obligations at Tenex, should grow to about 24 MM pounds in 1980 and 29 MM pounds in 1981 and 1982. No further penetration of this market is planned during the plan period.

Specialty Markets

The only specialty compound currently planned for development in the 1979-1980 time period is the seismographic tubing compound for Blackwell.

This compound is near the end of the development cycle; and while no sales have been budgeted, sales may occur in 1979. This polymeric plasticized/nitrile rubber compound will sell at gross margins of 8-10¢/pound higher than the average margin realized by CONOCO.

While not considered a specialty market, specialty compounds will be developed on customer request at accounts which purchase large volumes from CONOCO. Careful consideration will be given to each request of this nature and we may refuse the business based on individual circumstances.

Manufacturing Strategy

Manufacturing will, during the time period, work on methods which will allow consistent production of product at higher rates than currently recognized. With the new compound line, the production of mill scrap is expected to 0.1% and efforts will be made to reduce the scrap on Line III below the current 1.7%. About 30-50% of the H-grade compound is caused by burned resin. Control of this type of rejection will be reduced. Bottleneck's removal of line III combined with installation of a dye faced pelletizer will drastically reduce the scrap rates while increasing productivity.

During the plan period, engineering work will be accomplished to assure the timely budgeting and installation of the major capital projects proposed in the overall plan.

R & D Strategy

R&D plans will be directed toward providing CONOCO with a quality compound slate second to none. The review of our current formulations will continue and basic information in various raw materials will be obtained to assist future formulation work. In the electrical area specific end uses which could profit from low smoke and flame will be identified and formulations prepared for this market. Soft molding compounds which will be within capability of the new compound line will be developed for the electrical grommet and shoe market.

For the support of Marketing, a "dictionary" of competitive compounds will be developed which will ultimately contain the results of physical test conducted by CONOCO's labs.

Manufacturing support will be available to assist in any programs designed for product consistency. This support will include test methods for quickly identifying the quality of the product being produced.

Profit and Volume Objectives

Using the 1979 Long Range Plan values the compound margin, relative to past years, is projected to grow from \$ M to \$ M in 1982. A portion of the increase is based on growth while a portion is based on improved pricing in telephonic communications and floor runner business.

<u>Profit Objectives</u>	<u>Actual</u>			<u>Forecast</u>		
	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Volume MM Pounds	29.1	42.7	46.0	59.8	68.0	77.0
Gross Margin, \$M's	3,167	4,187	5,076	7,812	8,883	10,059
Fixed Cost			3,385	4,007	4,508	4,997
Contribution Prior to BA Expense			1,691	3,805	4,375	5,062
Margin with Resin at Alt. Pipe Price	2,362	2,827	2,693	5,478	5,805	6,192
Estimated Fixed			<u>2,219</u>	<u>2,841</u>	<u>3,081</u>	<u>3,350</u>
Before Tax Contribution over Alt. Resin Value			474	2,637	2,724	2,842

PHTHALATE PLASTICIZERS

Since the inception of the Aberdeen PVC Compound operations, the mix of plasticizers needed for flexible compounds have been produced for internal consumption. In some years, small quantities of linear phthalate plasticizers have been sold. Though most sales were of a market development nature for the CONOCO ALFOL Alcohols Business Area, our one large customer dropped us because we had no other regular plasticizer customers. CONOCO's current capacity for plasticizers is 25 MM pounds per year.

With the expansion plans for CONOCO's flexible compound business, CONOCO's internal demand for phthalate type plasticizers will be growing from approximately 16 MM pounds per year in 1979 to 34 MM pounds per year in 1988. These plasticizers can be produced in CONOCO's plasticizer unit at a cost which is significantly less than the alternate of purchasing plasticizers on the open market. While not necessarily true for the linear alcohols, the propylene based non-linear alcohols and the phthalic anhydride should be available on the open market.

Market Outlook

The phthalate plasticizer supply picture is influenced by three factors - ester capacity, alcohol capacity and phthalic anhydride capacity. Ester capacity is difficult to define because many companies include trimellitates, polymeric and other non-phthalate plasticizers in their reported capacities. Considering only the plasticizer producers who manufacture phthalate plastics, the installed ester capacity is approximately 1,770 million pounds per year. Of this capacity, about 370 million pounds is used for non-phthalate plasticizers. This leaves 1,400 million pounds per year of capacity to meet the estimated demand of 1,300 million pounds in 1980. Also, currently, about 50 million pounds per year of DOP is being imported from Eastern Europe.

In 1980, the overall supply of plasticizer range alcohols is expected to be snug but adequate. Installed capacity, not counting W. R. Grace's plant in Puerto Rico, is about 1,155 million pounds versus an estimated demand for plasticizers of 1,000 million pounds. If W. R. Grace's plant in Puerto Rico operates (long term this plant should be in operation), an additional 300 million pounds per year of capacity would be added to the market. In the meanwhile, Exxon's recent 150 million pounds per year expansion plus imports of alcohol and plasticizers from Eastern Europe should cover that portion of the supply previously originating in Puerto Rico. If this is not adequate, further supplies could come from a reduction in the 50-80 million pounds per year of U.S.

origin material which is exported and by imports from Western Europe. Union Carbide also operates an alcohol plant for internal consumption which has about 50 million pounds per year of spare 2-ethyl hexanol capacity. If prices increase, they may consider re-entering the plasticizer and alcohol market place. Even though supply of total alcohols should be adequate, specific alcohols may be in short supply. The availability of aluminum powder may restrict the availability of linear alcohols from Conoco, Monsanto and Ethyl (Ethyl supplies the olefin needed by Monsanto).

The linear phthalate plasticizer market amounted to 365 million pounds in 1978 and with an unrestricted estimated growth of 6% per year, could grow to 460 million pounds by 1982. Linear phthalates today constitute about 25% of the total phthalate plasticizer supply. Usually, linears are used for their excellent cold temperature properties; but a significant poundage is used in applications which do not have overly demanding cold temperature requirements. In the next one to three years, the availability of linear plasticizers will be limited by the availability of linear alcohols. While this will generate the appearance of a shortage, the gradual replacement of linears by other phthalates in uses which are not low temperature critical should cover the near term demand growth for the temperature critical applications.

Longer term, the picture becomes more clouded. There is pressure from the specialty alcohol market to remove the linear alcohols from the low netback plasticizer market to fill needs in the higher netback single cut and specialty market. This will tighten the linear plasticizer market and will tend to force the differential between the linear and non-linear plasticizers to increase. Since current prices of the ethylene based linear alcohols will not support new grass roots investment for plasticizer range alcohols, the only new linear alcohol capacity will come as incremental expansions, by-products of surfactant alcohol manufacturing or introduction of a new alcohol technology using propylene, butylenes or normal paraffins as the feedstock. The ultimate price differential between linear and non-linear plasticizers will be set by the cost of using the propylene based non-linears plus additives to obtain cold properties equal to those of the linear plasticizers. If this is less than the cost of linear plasticizers, the use of linears in PVC will probably decline.

Supplies of phthalic anhydride for plasticizers should be adequate during the plan period with a current capacity of 1,320 million pounds per year versus a demand of approximately 1,100 million pounds per year. However, if operating problems similar to those experienced in 1977 occur or if failure of announced expansions to be consummated occurs, a slight shortage could result.

Early in the plan period phthalic anhydride may be limited by the major raw material o-xylene. To some extent the availability of the o-xylene needed for phthalic anhydride manufacturing is dependent on the demand for unleaded gasoline. There is a shortage of the octane boosters needed to manufacture unleaded gasoline and xylenes are an outstanding

source of octane improvement. The o-xylene most likely will be preferentially used for chemical feedstocks provided prices received are equal to the gasoline blending values. Moderation, by the EPA, of unleaded gasoline regulations could reverse this price pressure.

Feedstock Supply

Branch and linear alcohols as well as Phthalic Anhydride are the major raw materials used in our plasticizer unit. The alcohol portion of the molecule is supplied from our Alfol alcohol plant (35%) and from outside branched alcohol producers (65%). During this period branched alcohol producers, who also manufacture plasticizers, will be trying to upgrade, thereby reducing the merchant alcohol supply. We will attempt to process our raw materials into alcohol, while keeping our Alfol alcohol production as a back up supply. Phthalic Anhydride, the other major raw material is covered under contract for the three year period. By mid 1980, we will begin toll processing Ortho Xylene from chocolate Bayou to PA through Stepan, further satisfying our PA portion.

Manufacturing Strategy

A good deal of work will be done on the water pollution and irritant problems created by the plasticizer unit. A "solution" to the problems will be handled through capital expenditures in the 1980 and 1981 capital budget. Cost is estimated at \$250 - \$1,000M. Other programs will include yield and stream factor improvement.

Product Strategy

CONOCO's plasticizer strategy during the plan period will be to manufacture internally those plasticizers needed for compound operations. Also, steps will be taken which will be designed to reduce our unit costs of manufacturing plasticizers as well as opening up the possibility of using additional CONOCO raw materials in the plasticizer unit. While its primary purpose will be to supply raw materials for our compound production we will continue to evaluate sale of incremental plasticizer to more fully utilize our capacity.

Product Plans

Currently Conoco is under utilizing its capacity. Internal consumption in 1980 is projected to be 17 MM pounds. Plasticizer utilization over the next three years is projected as follows:

	1980	1981	1982
DOP	6.6	7.3	7.8
610P	5.5	5.8	7.1
DIDP	4.9	5.2	5.7
	17.0	18.3	20.6
% utilization	68	73	82