

**Analysis of the Complaint and Proposed Consent Order to Aid Public Comment
The Dow Chemical Company and Union Carbide Corporation
File No. 9910301, Docket No. C-3999**

I. Introduction

The Federal Trade Commission (“Commission”) has accepted for public comment a Decision and Order (“Order”), pursuant to an Agreement Containing Consent Orders (“Consent Agreement”), against The Dow Chemical Company (“Dow”) and Union Carbide Corporation (“Carbide”) (collectively “Respondents”). The Order is intended to resolve anticompetitive effects stemming from the proposed merger of Dow and Carbide (the “Merger”). As described below, the Order seeks to remedy anticompetitive effects of the merger in polyethylene, ethyleneamines, ethanolamines and methyldiethanolamine (“MDEA”). The Order remedies those anticompetitive effects by requiring Respondents to divest and license certain intellectual property and other assets relating to polyethylene to BP Amoco plc (“BP”); to divest Dow’s worldwide businesses in ethyleneamines to Huntsman International LLC (“Huntsman”); and to divest Dow’s worldwide ethanolamines business and its MDEA business in the United States and Canada to Ineos Group plc (“Ineos”). The Commission has also issued an Order to Maintain Assets that requires Respondents to preserve the businesses they are required to divest as a viable, competitive, and ongoing operation until the divestiture is achieved.

The Order, if finally issued by the Commission, would settle charges that the Merger may have substantially lessened competition in the markets for polyethylene and polyethylene technology, ethyleneamines, ethanolamines and MDEA. The Commission has reason to believe that the Merger would violate Section 7 of the Clayton Act and Section 5 of the Federal Trade Commission Act. The proposed complaint, described below, relates the basis for this belief.

II. Description of the Parties and the Proposed Merger

Dow, headquartered in Midland, Michigan, is a large, worldwide chemical company, with particular strength in polyethylene, the world’s most widely used plastic, and in key technologies relating to the manufacture of polyethylene. Carbide, headquartered in Danbury, Connecticut, is also a large, worldwide chemical company, and a leading developer and licensor of polyethylene process technology.

Pursuant to a merger agreement dated August 8, 1999, Dow and Carbide propose to merge in a transaction pursuant to which Carbide shareholders would exchange their shares for shares of Dow.

III. The Proposed Complaint

According to the Commission’s proposed complaint, the merger would substantially reduce competition in four lines of commerce: linear low density polyethylene (“LLDPE”) in the United States and Canada, and related technology (both metallocene catalysts and reactor processes) worldwide; the worldwide market for metallocene catalysts for use in producing

LLDPE; the worldwide market for LLDPE reactor process technology; the worldwide market for ethyleneamines; the worldwide market for ethanolamines; and the market for branded MDEA in the United States and Canada.

A. **Count One: Polyethylene**

The proposed complaint alleges that the merger would substantially reduce competition in polyethylene. Three interrelated polyethylene markets are affected by the merger: (1) LLDPE in the United States and Canada; (2) metallocene catalysts for LLDPE production worldwide; and (3) LLDPE reactor process technology worldwide. As alleged in the proposed complaint and described below, the reduction or elimination of competition in metallocene catalyst technology, resulting from the merger, in turn reduces competition in LLDPE itself and in LLDPE reactor process technology. The reduction in competition in LLDPE process technology in turn further reduces competition in LLDPE.

Polyethylene is the world's most widely used plastic, and LLDPE is the fastest growing type of polyethylene. LLDPE is particularly well suited for applications that require both flexibility and strength. One of the most significant uses of LLDPE is in making trash bags, and LLDPE is used to make bags out of plastic films that are strong, thin and puncture resistant. Dow and Carbide are leading producers of LLDPE in the United States and Canada, and throughout the world.

The proposed complaint alleges that LLDPE is a differentiated product, and that Dow and Carbide are among the LLDPE producers that have succeeded in developing specialty, high performance polymers demanded by significant users of LLDPE (notably makers of branded trash bags and cast stretch film).¹ Dow has historically led the industry in production and sale of premium LLDPE polymers tailored to deliver performance characteristics demanded by many LLDPE users, and has been able to sell premium LLDPE at premium prices.

Polyethylene is made in polymerization reactions in the presence of a catalyst. Both the reactor technology and the catalyst technology are patented, and both Dow and Carbide are leading developers of reactor technology. Carbide's reactor technology, called "Unipol," is the world's most widely licensed polyethylene process technology. The other significant licensed LLDPE technology is "Innovene," owned by BP. Both Unipol and Innovene make polyethylene in a process in which ethylene is in a gaseous form during polymerization ("gas phase"). Dow's reactor technology, which Dow does not license, polymerizes ethylene in solution. The large

¹ In a differentiated product market, the merger of firms whose products are closer substitutes is more likely to result in a significant lessening of competition, because sales that (pre-merger) one of the merging parties would have lost to the other, in the event of a price increase, would now be retained by the merged firm. U.S. Dep't of Justice & Federal Trade Comm'n, *Horizontal Merger Guidelines* § 2.21; *FTC v. Swedish Match*, slip op. 33-34 (D.D.C. Dec. 14, 2000) (Civ. No. 00-1501 TFH).

majority of LLDPE reactor capacity is gas phase rather than solution.

Dow and Exxon Mobil Corp. (“Exxon”) have succeeded in developing and commercializing “metallocene” catalysts, which represent a significant advance over conventional LLDPE catalysts. The proposed complaint alleges that, if metallocene catalysts were generally available to LLDPE producers, those producers likely would be able to erode Dow’s position as the world’s leading producer of premium LLDPE polymers.

Both Dow and Exxon entered into joint ventures with the leading gas technology firms (BP and Carbide, respectively) to develop and commercialize metallocene catalysts for use in gas reactors. Both the Dow/BP joint development program and the Exxon/Carbide joint venture, Univation Technologies LLC (“Univation”), succeeded in adapting metallocene catalysts for use in gas reactors; both sought to license that technology to other gas-process LLDPE producers; and both indeed sold licenses to metallocene catalysts for gas reactors.

In 1999, however, Dow entered into an agreement to merge with Carbide, which would result in Dow becoming a partner with Exxon in Univation. As alleged in the proposed complaint, at or about the time Dow entered into the merger agreement with Carbide, Dow determined that it would not continue its joint development program with BP, and that it would not license its metallocene catalyst to BP (with rights to sublicense), thereby effectively terminating any ability by BP to license metallocene catalysts in competition with Univation (in which Dow would, as a result of the merger, succeed to Carbide’s interest).

The proposed complaint alleges that each of the polyethylene markets would be highly concentrated as a result of the merger. The proposed complaint further alleges that Dow and Carbide are direct and significant actual competitors in the market for LLDPE in the United States and Canada; that Dow and Carbide (through Univation) are direct and significant actual competitors in the market for metallocene catalyst technology worldwide; and that Dow and Carbide are actual and potential competitors in the market for LLDPE process technology worldwide. The proposed complaint further alleges that, as part of its course of dealing in connection with the merger, Dow’s actions terminating the Dow/BP joint development program and refusing to license metallocene catalysts to BP significantly reduced competition in LLDPE process technology by impairing BP’s ability to compete in that market.² The proposed complaint also alleges that entry into the relevant markets would not be timely, likely, or sufficient to deter

² The Commission can, under Section 5 of the FTC Act, 15 U.S.C. § 45, infer that facially independent actions or agreements nonetheless constitute intertwined events that should be considered together for the purpose of evaluating whether their effect constitutes a violation of the Act. *SKF Industries, Inc.*, 94 F.T.C. 6, 95 (1979). The proposed complaint alleges that Dow’s decision to enter into the merger agreement with Carbide, and its decisions (1) to allow the Dow/BP joint development agreement to expire by its terms and (2) not to license its metallocene technology to BP, are sufficiently related to consider together in examining the effects of the merger.

or offset adverse effects of the acquisition on competition.

The proposed complaint alleges that Respondents' merger would eliminate actual or potential, direct, and substantial competition between Respondents in the relevant markets. Elimination of this competition would likely result in increased prices for LLDPE polymers, metallocene technology licenses and LLDPE process technology licenses; and lessened innovation in each of these markets. Specifically, by eliminating BP as an alternative source of metallocene catalysts for Dow's competitors (the majority of which use gas phase LLDPE reactor technology), and by acquiring Carbide's interest in Univation, Dow would be in a position to impede the development, licensing and use of metallocene catalysts and thereby benefit Dow's own polyethylene business. The merger (and the related termination of the BP/Dow joint development agreement) would also lessen BP's ability to compete with Univation in polyethylene process technology, and thereby further impair competition in polyethylene.

B. Count Two: Ethyleneamines

Ethyleneamines are a family of chemicals containing at least one ethylene and one amine molecule and are used in a broad variety of applications, including lubricating oil additives, chelating agents, wet-strength resins, epoxy curing agents, surfactants, personal care products, pulp and paper products, and fungicides. Dow and Carbide are the only producers of ethyleneamines in the United States and Canada, and together sold approximately \$170 million worth of ethyleneamines in 1999. There are no cost-effective substitutes for ethyleneamines in the end-uses for which they are used.

Dow and Carbide compete in the United States and Canada in the production and sale of ethyleneamines, and also compete outside the United States and Canada. The proposed complaint alleges that the United States and Canada constitute a properly defined geographic market, and that the world also constitutes a properly defined geographic market. Whether the market is defined as the United States and Canada (in which Dow and Carbide are the only producers) or the world (in which the market is highly concentrated, and Dow and Carbide combined would have more than 50% of worldwide capacity), the merger would result in a highly concentrated market, and concentration would increase substantially. The proposed complaint alleges that entry would not be timely, likely or sufficient to constrain an anticompetitive price increase or reduction in output.

C. Count Three: Ethanolamines

Ethanolamines are a family of chemicals, comprising monoethanolamine ("MEA"), diethanolamine ("DEA"), and triethanolamine ("TEA"), made by reacting ethylene oxide and ammonia. Ethanolamines are used in a broad variety of applications, including the production of ethyleneamines, and in surfactants, personal care products, herbicides, oil and gas refining applications, pharmaceuticals and fabric softeners. The proposed complaint alleges that there are no cost-effective substitutes for ethanolamines in the end-uses for which they are used, and that

the proper geographic market to analyze the effect of the merger on the sale of ethanolamines is the United States and Canada.

Carbide and Dow are the largest and third largest producers, respectively, of ethanolamines in the United States and Canada. As a result of the merger, proposed Respondents would have more than 60% of sales in the relevant market, and two firms would have more than 90%. The proposed complaint alleges that entry would be unlikely to remedy the likely anticompetitive effects of the merger.

D. Count Four: MDEA-Based Gas Treating Products

Methyldiethanolamine (“MDEA”) is a powerful solvent used in gas treating to remove unwanted compounds from gas streams. MDEA is used in oil refineries, natural gas plants, ammonia plants and other facilities that handle hydrocarbon gases. While some MDEA is sold alone, a substantial portion of the MDEA sold in the United States and Canada is sold blended with additives and other chemicals, including ethanolamines, and is sold on a branded basis. Branded MDEA is often sold bundled with engineering services relating to gas treating.

The proposed complaint alleges that MDEA-based gas treating products constitute a relevant product market and that the United States and Canada constitute a relevant geographic market. As alleged in the proposed complaint, because of the high cost associated with failure of gas treating products, customers that purchase MDEA-based gas treating products would be unlikely to substitute commodity MDEA in the event of a small but significant, nontransitory price increase of MDEA-based gas treating products. Dow and Carbide are the two largest sellers of MDEA-based gas treating products. As a result of the merger, Respondents would have approximately 60% of the relevant market, and three firms would have approximately 90% of that market. The proposed complaint alleges that entry is unlikely to counteract the competition lost by the merger.

IV. Terms of the Agreement Containing Consent Order

The proposed Order is designed to remedy the anticompetitive effects of the merger in the markets alleged in the proposed complaint, as described below.

A. Polyethylene

The proposed Order would remedy the anticompetitive effects of the merger by (1) allowing BP to develop and license metallocene catalysts to the majority of LLDPE producers worldwide, *i.e.*, those that make LLDPE in gas phase reactors, without being subject to patent claims by Dow, Univation or Exxon; and (2) enabling Exxon to develop and license metallocene catalysts and Unipol reactor process technology independently of Dow, should Dow’s participation in Univation frustrate Exxon’s interest in developing and licensing that technology.

Section VI of the proposed Order would enable BP to develop and license metallocene catalysts by (1) divesting to BP Dow's interest in the intellectual property developed jointly by Dow and BP, to which BP's rights were uncertain as a result of Dow's decision to terminate the joint development effort without resolving the ownership of those rights; (2) divesting Dow's remaining intellectual property (and related assets) specific to the gas phase process; (3) licensing Dow's metallocene catalyst technology to BP, with the right to sublicense that technology; and (4) licensing to BP, with rights to sublicense, Exxon patents controlled by Univation that otherwise would expose BP's efforts to develop, commercialize and license metallocene catalysts to infringement suit brought by Exxon or Univation. The divestiture and license would be made pursuant to a Divestiture and License Agreement executed by Dow and BP, which agreement is incorporated in and made part of the proposed Order.³

The purpose of the divestiture and license of intellectual property and related assets to BP is to enable BP to compete with Univation in developing, commercializing and licensing metallocene technology, remedying the anticompetitive effect in the market for metallocene catalyst technology. Moreover, by allowing BP to offer metallocene catalysts in connection with licenses of its Innovene gas phase reactor technology, the proposed Order is intended to preserve the viability of that technology as an alternative to Carbide's Unipol technology (which, through Univation, can offer metallocene technology). By preserving competition in both metallocene catalyst technology and LLDPE reactor process technology, the proposed order would allow BP licensees (or future licensees) in the United States and Canada to obtain metallocene catalysts from a source not controlled by Dow, thereby preserving metallocenes as a threat to Dow's premium polymer business, and providing a reactor process technology solution (including metallocenes) independent of Respondents.

Section VII of the proposed Order enables Exxon to retain rights, including the right to sublicense, in all Univation technology and in Carbide's Unipol process should the Univation venture be dissolved or should Dow come to control the Univation venture. The grant of this right to Exxon provides additional remedy to the anticompetitive effects alleged in the proposed complaint by allowing Exxon to develop and license the Unipol process independently of Dow, should Dow seek to impede Univation's licensing business for the benefit of Dow's polyethylene business.

B. Ethyleneamines

The provisions of Section II of the proposed Order would remedy the anticompetitive effects in the markets for ethyleneamines, as alleged in Count Two of the proposed complaint, by requiring proposed Respondents to divest Dow's global ethyleneamines business to Huntsman, a worldwide producer of chemicals and plastics, including ethylene derivatives. Huntsman does not today produce ethyleneamines.

³ That Divestiture and License Agreement is confidential and is not being placed on the public record. However, that Agreement may not contradict the terms of the proposed Order.

If the Commission, at the time that it makes the proposed Order final, notifies Respondents that it does not approve of the proposed divestiture to Huntsman, or the manner of the divestiture, the proposed Order provides that Respondents would rescind the sale to Huntsman and divest Dow's global ethyleneamines business within six months to an acquirer approved by the Commission and in a manner approved by the Commission. If Respondents did not complete the divestiture in that period, a trustee would be appointed who, upon Commission approval, would have the authority to divest Dow's global ethyleneamines business to a Commission-approved acquirer.

C. Ethanolamines

The provisions of Section III of the proposed Order would remedy the anticompetitive effects in the markets for ethanolamines, as alleged in Count Three of the proposed complaint, by requiring proposed Respondents to divest Dow's global ethanolamines business to Ineos, a producer of ethylene derivatives and other chemicals, which does not today produce ethanolamines.

If the Commission, at the time that it makes the proposed Order final, notifies Respondents that it does not approve of the proposed divestiture to Ineos, or the manner of the divestiture, the proposed Order provides that Respondents would rescind the sale to Ineos and divest Dow's global ethanolamines business within six months to an acquirer approved by the Commission and in a manner approved by the Commission. If Respondents did not complete the divestiture in that period, a trustee would be appointed who, upon Commission approval, would have the authority to divest Dow's global ethanolamines business to a Commission-approved acquirer.

D. MDEA-Based Gas Treating Products

The provisions of Section IV of the proposed Order would remedy the anticompetitive effects in the markets for MDEA-based gas treating products, as alleged in Count Four of the proposed complaint, by requiring proposed Respondents to divest Dow's "Gas Spec" MDEA business to Ineos.

If the Commission, at the time that it makes the proposed Order final, notifies Respondents that it does not approve of the proposed divestiture to Ineos, or the manner of the divestiture, the proposed Order provides that Respondents would rescind the sale to Ineos and divest Dow's Gas Spec MDEA business within six months to an acquirer approved by the Commission and in a manner approved by the Commission. If Respondents did not complete the divestiture in that period, a trustee would be appointed who, upon Commission approval, would have the authority to divest Dow's Gas Spec MDEA business to a Commission-approved acquirer.

E. Other Provisions of the Proposed Order

The proposed Order requires Respondents to provide the Commission with an initial report setting forth in detail the manner in which Respondents will comply with the provisions relating to the divestiture of assets. The proposed Order further requires Respondents to provide the Commission with a report of compliance with the Order within thirty (30) days following the date the Order becomes final and every thirty (30) days thereafter until they have complied with the terms of the Order.

F. The Order To Maintain Assets

Respondents have also agreed to the entry of an Order to Maintain Assets, which has been entered by the Commission and is effective immediately. The Order to Maintain Assets requires Respondents to preserve the ethyleneamine, ethanolamine and MDEA businesses that they are required to divest as viable and competitive businesses and conduct the businesses in the ordinary course of business until those businesses are divested to the Commission-approved acquirer. The Order to Maintain Assets also requires Respondents to preserve and maintain the polyethylene assets to be divested and licensed to BP.

V. Opportunity for Public Comment

The proposed Order has been placed on the public record for thirty (30) days for receipt of comments by interested persons. Comments received during this period will become part of the public record. After thirty days, the Commission will again review the proposed Order and the comments received and will decide whether it should withdraw from the proposed Order or make it final. By accepting the proposed Order subject to final approval, the Commission anticipates that the competitive problems alleged in the proposed complaint will be resolved. The purpose of this analysis is to invite public comment on the proposed Order, including the proposed divestiture, to aid the Commission in its determination of whether to make the proposed Order final. This analysis is not intended to constitute an official interpretation of the proposed Order, nor is it intended to modify the terms of the proposed Order in any way.