OPTIONS FOR OVERCOMING BLEND WALL

b. Waiver of Mid-Level Ethanol Blends (E15/E20)

For our primary ethanol usage analysis, we considered that there would only be two fuels in the future, E10 and E85. And as explained in Section V.D.2, we believe it is feasible to consume 34 billion gallons of ethanol by 2022 given growth in FFV production and E85 availability and projected improvements in the current E10/E85 price relationship.

However, several organizations and government entities are interested in increasing the concentration of ethanol beyond the current 10% limit in the commercial gasoline pool. Section 211(f)(1) of the Clean Air Act prohibits the introduction into commerce, or increase in the concentration in use of, gasoline or gasoline additives for use in motor vehicles unless they are substantially similar to the gasoline or gasoline additives used in the certification of new motor vehicles or motor vehicle engines. EPA may grant a waiver of this prohibition under Section 211(f)(4) provided that the fuel or fuel additive "will not cause or contribute to a failure of any emission control device or system (over the useful life of the motor vehicle, motor vehicle engine, nonroad engine or nonroad vehicle in which the device or system is used) to achieve compliance by the vehicle or engine with the emission standards to which it has been certified." The most recent “substantially similar” interpretive rule for unleaded gasoline presently allows oxygen content up to 2.7% by weight for certain ethers and alcohols. E10 contains approximately 3.5% oxygen by weight, which makes a gasoline-ethanol blend with ten% ethanol not “substantially similar” to certification fuel under the current interpretation. ***Since any mid-level blend would have a greater than allowed oxygen content, any mid level blend would need to have a waiver under Section 211(f)(4) of the CAA in order to be sold commercially.***

Before EPA grants a 211(f)(4) waiver for a new fuel or fuel additive, an applicant must prove that the new fuel or fuel additive will meet the waiver requirements outlined in the statute. EPA has required that applicants provide vehicle/engine testing for tailpipe emissions, evaporative emissions, materials compatibility, and driveability. Testing needs to include emissions over the full useful life of vehicle and equipment. Several interested parties are investigating the impact that mid-level ethanol blends (e.g., E15 or E20) may have on these areas among others (i.e. catalyst, engine, and fuel system durability, and onboard diagnostics). In order to use the information collected for waiver application purposes, the mid-level ethanol blend testing will need to consider the different engines and fuel systems currently in service that could be exposed to mid-level ethanol blends and the long-term impact of using such blends. After receiving a waiver application, EPA must give public notice and comment and has 270 days to grant or deny the waiver request.

The Department of Energy (DOE) has developed and initiated a comprehensive testing program to investigate the potential impacts of mid-level blends of ethanol. Initial testing was conducted on a limited number of high-volume vehicles and small non-road engines and a preliminary report was published in October, 2008. In addition, DOE is in the process of leveraging existing EPA vehicle and small engine test programs (originally designed to test up to 10% ethanol) to add mid-level ethanol blends to the fuel matrix. DOE’s comprehensive test program is intended to evaluate a wide range of emission, performance, and durability issues associated with mid-level ethanol blends (additional reports forthcoming).

DOE is not alone in pursuing mid-level blends. In 2005, the State of Minnesota, a large producer of corn ethanol, passed a law requiring that by 2015, 20% of gasoline (by volume) must be replaced by ethanol. While this level could be achieved with a high percentage of E85 usage by FFVs, the state has also expressed an interest in moving to 20% ethanol blends. Several other states and organizations have also expressed interest in increasing ethanol use by adopting E15 or E20. The Renewable Fuels Association (RFA) and the American Coalition for Ethanol (ACE) have been working with various government entities to investigate the impact of mid-level blends On March 6, 2009, Growth Energy and 54 ethanol manufacturers submitted an application for a waiver of the prohibition of the introduction into commerce of certain fuels and fuel additives set forth in section 211(f) of the Act. This application seeks a waiver for ethanol-gasoline blends of up to 15 percent by volume ethanol.

While the current Growth Energy waiver application is still under review, as a sensitivity, ***we considered the implications that adding E15 or E20 to the marketplace could have on ethanol usage and the supporting fuel infrastructure should such blends be permitted.*** For each case, we assumed that E10 would need to continue to remain in existence to meet the demand of legacy vehicle and non-road engine owners. This would also provide consumer choice. Experience in past fuel programs has shown that many consumers will not be comfortable refueling on higher ethanol blends and will blame any problems that may occur on the new fuel (regardless of the actual cause of the vehicle problems) causing a backlash against the new fuel requirements. Therefore, we believe it is critical to continue to allow consumers the choice between mid-level ethanol blends and conventional gasoline (assumed to be E10 in the future).

For our optimistic mid-level ethanol blends scenario, we assumed that E15 or E20 could be available at all retail stations nationwide by the time the nation hits the E10 blend wall, or around 2013. This assumes a number of actions are taken to bring mid-level blends to market (explained in more detail below). We assumed that E10 would be marketed as premium-grade gasoline, the mid-level ethanol blend (E15 or E20) would serve as regular, and like today, midgrade would be blended from the two fuels. Those vehicles and equipment which are unable to refuel on mid-level ethanol blends (or choose not to) could continue to fill up on E10. This mid-level ethanol blends scenario, described in more detail in Section 1.7.1.3 of the DRIA, concluded that if mid-level ethanol blends were to be distributed at all retail stations nationwide, they could help increase ethanol usage to over 19 billion gallons (with E15) and 25 billion gallons (with E20).

As shown in Figure V.D.2-2, in this optimistic phase-in scenario, adding E15 could postpone the blend wall by about three years to 2016 and adding E20 could postpone it another three years to 2019. Although mid-level ethanol blends will fall short of meeting the RFS2 requirements, they could provide interim relief while the county ramps up E85/FFV infrastructure and/or finds other non-ethanol alternatives (e.g., cellulosic diesel or biobutanol) to reach the RFS2 volumes.

Our nation's whole system of gasoline fuel regulation, fuel production, fuel distribution, and fuel use is built around gasoline with ethanol concentrations limited to E10. As a result, while a waiver may legalize the use of mid-level ethanol blends under the CAA, there are a number of other actions that would have to occur to bring mid-level blends to retail. The time needed to take these actions could delay the penetration of mid-level ethanol blends into the market. The CAA only provides a ***1 pound RVP waiver*** for ethanol blends of 10 volume percent or less. Lacking such an RVP waiver, a special low-RVP gasoline blendstock would be needed at terminals to allow the formulation of mid-level ethanol blends that are complaint with EPA RVP requirements. ***Providing such a separate gasoline***

blendstock would present significant logistical challenges and costs to the fuel distribution system.[247] ***A number of changes would be needed to EPA regulations*** including those pertaining to reformulated gasoline, anti-dumping, and gasoline deposit control additives to accommodate and mid-level ethanol blends. Such changes would need to be made through the notice and comment process similar to today's action***. In addition, most states require that fuel comply with the applicable ASTM***

[247] **It may be possible for refiners to formulate a gasoline blendstock that would be suitable for manufacturing mid-level ethanol blends and E10 at the terminal. While this would avoid the logistical problems associated with maintaining separate blendstocks, there could be significant additional refining costs**

International (formally known as the American Standards for Testing and Materials) specification. The development of an ASTM International specification for mid-level ethanol blends through an industry consensus process is currently being initiated.

There are a number of requirements regarding the fire and leak protection safety of retail fuel dispensing and storage equipment. The Occupational Safety and Health Administration (OSHA) requires that retail fuel handling equipment be listed with an independent standards body such as Underwriters Laboratories (UL). No independent standards body has listed fuel handling equipment for mid-level ethanol blends. Furthermore, UL has stated that it would not expand listings for in-use fuel retail equipment originally listed for E10 blends to cover greater than E10 blends.[248]

EPA's Office of Underground Storage Tanks (OUST) requires that UST systems must be compatible with the fuel stored in the system. These requirements pertain to all components of the system including the storage tank, connecting piping, pumps, seals and leak detection equipment. States typically adopt fire safety codes from either the National Fire Protection Association (NFPA) or the International Code Council (ICC). These organizations currently do not have provisions that would allow the mid-level ethanol blends to be stored/dispensed from existing equipment at retail. Local safety officials (e.g. fire marshals) referred to as "Authorities Having Jurisdiction" (AHJ's) often require a UL certification for fuel retail storage/dispensing equipment although some will accept other substantiation of equipment safety such as a manufacture certification.

Fuel retailers must also satisfy the requirements of the insurance company that they are insured through which may be more stringent than the legal requirements. Given the liability concerns associated with leaks from underground storage tanks, these issues have to be resolved in order to facilitate the widespread use of mid-level ethanol blends.

The Department of Energy and EPA are currently working with industry to evaluate what changes may be necessary to underground storage tank systems, fuel dispensers, and refueling vapor recovery equipment at fuel retail facilities to handle a mid-level ethanol blend. If existing equipment proves tolerant to a mid level ethanol blend, this could substantially facilitate its introduction at retail. If the data supports the suitability of legacy retail equipment to store/dispense a mid-level blend, then the process of seeking acceptance by the standard bodies discussed above could commence. The normal processes used by

[248] **UL stated that they have data which indicates that the use of fuel dispensers certified for up to E10 blends to dispense blends up to a maximum ethanol content of 15 volume percent would not**

result in critical safety concerns (http://www.ul.com/newsroom/newsrel/nr021909.html). Based on this, UL stated that it would support authorities having jurisdiction who decide to permit legacy equipment originally certified for up to E10 blends to be used to dispense up to 15 volume percent ethanol. The UL announcement did address the compatibility of underground storage tank systems with greater than E10 blends.

these standards bodies can be lengthy. For example, the NFPA has a 3 year cycle for evaluating changes to its codes with proposals for the current cycle due this June. Thus, apart from the need to technically evaluate the suitability of legacy retail equipment to handle a mid-level ethanol blend, the need to secure recognition from standards bodies could delay the introduction of a mid-level ethanol blend at retail should a waiver be granted by EPA.

If some components of the above ground existing retail hardware are found to be incompatible with a mid-level ethanol blend, it may be possible for them to be replaced through normal attrition. For example the "hanging hardware" which includes the nozzle and hose from the dispenser is typically replaced every 3 to 5 years. It is also possible that only minor changes might be needed to equipment that has a longer service life which might be accomplished without too much difficulty/cost. ***However, if extensive new equipment is needed and particularly if this involves the breaking of concrete, we believe that it is unlikely that fuel retailer would opt to install equipment specifically for a mid-level ethanol blend given the projected future need for retail equipment capable of handling E85.***[249]

Finally, all vehicles and nonroad equipment currently in-use are only warranted for ethanol levels not exceeding E10 (except for FFVs), and the owners manuals are written to reflect this. Before widespread acceptance of mid-level ethanol blends by consumers can occur, these warranty issues would need to be addressed.

[249] **A discussed previously, significant penetration of E85 is projected to be needed to facilitate the use of the volumes of ethanol we project would be needed to satisfy the requirements of the EISA. 258**