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and Natural Gas Provider Fleets

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Potential Impacts of the Energy Policy Act on Electricity and Natural Gas Provider Fleets

by

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ABSTRACT

Section 501 of the 1992 Energy Policy and Conservation Act (EPACT) mandates that alternative-fuel providers who may sell such fuels for transportation uses acquire alternative-fuel vehicles (AFVs). The potential impacts of this mandate on the two largest groups of alternative-fuel providers — electricity and natural gas (NG) providers — are presented. Nationwide, 166 electric-only utility companies, 127 NG-only utility companies, and 55 dual-utility companies will be covered by EPACT. Together, these companies own/operate nearly 122,000 light-duty vehicles in the EPACT-defined metropolitan areas. Some 63 natural gas producers and transporters, which have 9,700 light-duty vehicles, are also covered. We project that covered fuel providers will purchase 2,710 AFVs in 1996 and 13,650 AFVs by 2001. We estimate that natural gas companies already have 19.4% of their existing light-duty vehicle stocks as AFVs, dual companies have 10.0%, natural gas producers and transporters have 7.0%, and electric companies have only 1.6%. If the existing AFVs count toward meeting the Section 501 requirements, NG providers (NG utilities, dual utilities, and NG producers and transporters) will need to make little additional effort, but electric companies will have to make substantial commitments to meet the requirements.

Key Words: EPACT, LDV, MSA, NG Providers, Electric Utilities.

INTRODUCTION

Almost entirely dependent on petroleum, the U.S. transportation sector consumed 21.8×10^{15} Btu (equivalent to 10.3 million barrels of crude oil per day) of petroleum in 1992, nearly two-thirds of the total petroleum consumed in the United States (1). Light-duty vehicles (LDVs), including passenger cars, vans, pickups, and sport utility vehicles, account for over 60% of the petroleum consumed by this sector. Furthermore, energy consumption by LDVs is projected to increase 22.1% by 2010 (2). Aiming at increasing U.S. energy security through reducing oil consumption, the U.S. Congress enacted the 1992 Energy Policy and Conservation Act (EPACT) (3), through which the use of alternative fuels is required. Among the requirements for using alternative fuels, EPACT establishes mandates to increase the number of alternative-fuel vehicles (AFVs) in fleets. In particular, the EPACT Section 501 mandates AFV acquisition by alternative-fuel providers who may sell alternative fuels for transportation uses. To ascertain the impacts of the Section 501

mandate, Argonne and Oak Ridge National Laboratories conducted an analysis of fuel providers that will be covered, their LDV fleet size, and the number of AFVs they are likely to purchase. The analysis covered all alternative fuels (i.e., ethanol, methanol, hydrogen, liquid petroleum gas [LPG], natural gas, and electricity), as well as petroleum. A summary of the analysis of these fuels is presented in a separate paper (4).

Among the alternative-fuel providers, electricity and natural gas (NG) providers constitute a large group, own/operate large vehicle fleets, and are likely to be affected the most by the mandate. Argonne National Laboratory (ANL) conducted a detailed analysis of NG and electricity providers. In this analysis, ANL identified the NG and electric utility companies likely to be covered by the Section 501 requirements, their existing light-duty vehicle stock, and their likely AFV purchases. In this paper, we present the analytical approach and the estimates of the future AFV purchases by the covered NG and electric companies.

THE NG AND ELECTRIC INDUSTRIES AND EPACT SECTION 501 REQUIREMENTS

NG, a fossil fuel, is either extracted from NG fields or is produced together with crude in oil fields. Raw gas is sent to NG plants where it is cleaned (stripped), purified, and odorized. The processed NG is then transported and distributed through a network of pipelines, with intermittent storage as necessary. NG producers, transporters, and distributors (i.e., utilities) are subject to the Section 501 mandate as alternative-fuel providers. LDV fleets of NG producers are located in different places, because their production activities are scattered over many places. Furthermore, production activities are often located out of metropolitan areas. Even though the headquarters of NG transporters are usually located in metropolitan areas, substantial parts of their fleets are stationed outside of metropolitan areas, simply because their collection and transportation activities are scattered. However, many NG distributors — NG utility companies in almost all cases — are located in and serve metropolitan areas. A large number of LDVs in the NG industry are owned/operated by NG utilities.

The electric industry may be the largest sector in terms of the number of fleet vehicles subject to the EPACT Section 501 requirement. A majority of the electric utility companies are involved in all of the three business operations: generation, transmission, and distribution of electricity. Since the early 1980s, many independent power producers have emerged as electric generators. And recently, new companies have been formed that act as power brokers and find electricity for distributors from power generators.

Both NG and electric utility companies can be investor-owned, municipal, or cooperative. Investor-owned companies are usually large. A municipal company serves a municipality and is often involved in distribution only (although large municipal companies, such as the Los Angeles Department of Water and Power and Sacramento Municipal Utility District, are involved in generation, transmission, and distribution of electricity). Cooperative electric companies usually serve small towns and rural areas and may co-own power plants. Nearly 1,000 NG utilities distribute NG across the United States (5). According to Electric World's Directory of Electric Utilities (6), there are about 3,200 electric utility companies nationwide. Among them, about 1,500 are investor-owned, and 1,700 are municipal or cooperative.

The NG and electric utility companies may provide either NG or electricity, or both. In this paper, we identify a utility that provides both natural gas and electricity as a dual utility. A dual utility may also provide other services, such as water and sewer. Typically, dual-utility companies generate more revenue from electricity than from NG. Although the number of electric-only or NG-only companies far exceeds the number of dual-utility companies, dual-utility companies are usually large in terms of customers and vehicle fleet size. For example, one of the largest utility companies — Pacific Gas & Electric Company — is a dual-utility company.

The Section 501 mandate requires that beginning in 1996, an increasing number of new LDVs acquired by the alternative-fuel providers who own/operate 20 or more LDVs in an EPACT metropolitan statistical areas (MSA) must be AFVs. Except for the electric utilities that can elect to acquire electric vehicles (EVs) and notify their intent in advance, the schedule of AFV purchases by model years is specified as follows: 30% for 1996, 50% for 1997, 70% for 1998, and 90% for 1999 and thereafter. For electric utilities that decide to acquire EVs, the schedule of EV purchases may be the following: 30% for 1998, 50% for 1999, 70% for 2000, and 90% for 2001 and thereafter.

An EPACT MSA is defined as an area with a 1980 population of over 250,000. There are 125 MSAs nationwide where electricity and NG providers are subject to these requirements (7). These 125 MSAs span 537 counties, 17 Louisiana parishes, 23 cities (Baltimore, St. Louis, and 21 cities in Virginia), the state of Rhode Island, and the District of Columbia (7). The MSAs are served by about 300 electric, 190 NG, and 60 dual utilities. In addition, vehicle fleets of some NG producers and transporters and multistate utility company administrative offices are located in the EPACT MSAs.

ANALYTICAL APPROACH

EPACT Section 501 covers LDVs that are centrally fueled or are capable of being centrally fueled. In analyzing the fleets of NG and electricity providers, we assume that all of their LDVs are capable of being centrally fueled. A covered provider is determined as one who serves at least one EPACT MSA and has 19 or more vehicles in a single MSA. The following four-step procedure for identifying the covered NG and electricity providers and for estimating their affected vehicle fleet was developed.

First, NG and electric companies that are subject to the Section 501 mandate are identified through their business activity locations. If the activity locations of a company are within any of the 125 EPACT MSAs, the company is potentially covered.

Second, the numbers of LDVs owned/operated by potentially covered NG and electric companies are estimated. For this purpose, we relied on various surveys and databases.

Third, the number of LDVs owned/operated by a company in each of the served EPACT MSAs is estimated and the potential coverage is ascertained. We used a procedure to allocate total LDVs to EPACT MSAs and other areas. If the LDVs allocated to a single MSA exceed or equal 20, the company and its vehicles are subject to the mandate.

Finally, profiles of new-vehicle purchases are analyzed, and the potential purchases of alternative vehicles are estimated. We estimate the number of new LDVs purchased as the percentage of the total existing LDV stock. We then project the number of new vehicles purchased each year in the future. Finally, by taking into account the 501 AFV acquisition mandate, we project new AFV purchases during each year in the future.

Because of population and economic growth, electricity and NG consumption will increase 1.1% and 1.2% per year, respectively, between 1993 and 2010 (2). These growth rates indicate that the size of electricity and natural gas provider fleets may grow. We examined the utility truck fleets in the 1982 and 1987 Truck Inventory and Use Surveys (8,9) to get some indication of the possible rate of growth. The size of the utility light-truck fleet was 470,000 in 1982 and 363,600 in 1987, a drop of 23%. During the same period, electricity sales increased 18%, natural gas consumption dropped 4.4%, and total light-truck registrations increased 20% (1,10). We concluded that the projected annual increases are not likely to substantially increase the sizes of the natural gas and electricity provider vehicle fleets. This no-growth assumption will provide a slightly lower estimate, but it will not seriously undermine our analysis.

Two types of data are necessary for our analysis: the geographic locations of company services and company LDV fleet sizes. Initially, we canvassed some fuel providers through a questionnaire to ascertain the extent of coverage (11). After the initial stage, we identified various fleet data sources for electricity and NG providers. We produced lists of electric and NG companies on the basis of primarily three publications (5,6,12). We collected vehicle fleet data from the surveys conducted by EIA, industry associations, and industry publications. Data relating to the utility service areas were collected from industry-specific publications (5,6). In those cases in which the service areas of some companies were not fully defined in these publications, we contacted state utility regulatory agencies and utility companies themselves.

EPACT Section 407 requires that vehicle fleet data be collected. To fulfill this requirement, EIA has conducted surveys of electric and NG companies seeking information on their vehicle fleets (13,14). In EIA's surveys, questions relating to vehicle stock and new-vehicle purchases by fuel type are asked. For the electric utility survey, EIA sent survey forms to 3,200 electric companies and received responses from 997 companies that reported having fleets of 10 or more vehicles in 1993. Among those 997 companies, about 300 companies had fleets of 20 or more vehicles. We obtained fleet data for the 300 electric companies from EIA. In the case of natural gas companies, EIA collected data for 553 utilities, producers, and transporters.

The EIA surveys did not include some electric and NG companies that were on our lists. We investigated other data sources and found information relating to some of the missing utility companies. In particular, we have used three additional databases to supplement the EIA surveys. The first source is a fleet vehicle survey conducted in 1993 for the American Gas Association and Edison Electric Institute (AGA/EEI). The survey, sponsored annually by AGA/EEI, seeks fleet information by vehicle and fuel type (conventional and alternative fuels) (15). The 1993 AGA/EEI survey collected fleet information from 83 electric, NG, and dual-utility companies. The second source is a fleet vehicle survey conducted by the *Natural Gas Fuels Magazine*. The survey covered 150 NG utilities, of which 133 are located in the United States (16). The survey provides data relating to the total vehicles (including heavy-duty vehicles) and AFVs. The third source is a

commercially available fleet database created by Dwight's Energy Research, Inc (17). The Dwight's database contains fleet vehicle information for individual companies across all industrial and commercial sectors, including the electric and NG utility sector. We retrieved fleet data for some utility companies from the Dwight's database.

Of the 83 companies surveyed by AGA/EEI, 41 companies were surveyed by EIA as well. We compared the fleet data between the EIA and AGA/EEI surveys for the 41 common companies. Table 1 summarizes the results of the comparison. Except for vans and heavy-duty trucks (HDTs), the means of differences are small. However, the standard deviations of the differences are large, which implies that there are large differences in reported vehicles by type (i.e., cars, vans, light trucks, and heavy trucks) within a company. The differences become smaller when the vehicles are added together, meaning that some of the differences for individual vehicle type are due to the misreporting of vehicles from one type (such as light trucks) to another (such as vans) between the surveys. Overall, the results of the two surveys are close.

TABLE 1. Difference in Number of Vehicles Reported between the EIA and AGA/EEI Surveys

Vehicle Category	Mean	Standard Deviation
Passenger Cars	-1.7%	25.7%
Vans	11.6%	48.4%
Light-Duty Trucks (LDTs)	3.6%	39.3%
Light-Duty Vehicles	6.8%	19.2%
Heavy-Duty Trucks (HDTs)	-23.6%	80.0%
All Vehicles	2.1%	14.9%

Note: A negative number means that vehicles are under-reported in the AGA/EEI survey, and a positive number means that vehicles are under-reported in the EIA survey.

Data on the geographic locations of the vehicle fleets are not readily available. All surveys provided fuel provider addresses, but they contained very little information on the geographic locations of vehicles. One exception was the Dwight's database, which provides fleet geographic locations. However, total vehicle counts in the Dwight's database do not match those of the other three surveys. Further investigation revealed that the database contains information collected through fleet surveys having limited coverage. Industry publications (5,6) provide information relating to the communities served and, in most cases, the number of customers (or population) served in each community. We were able to designate each community as being inside or outside an EPACT MSA by using the EPACT MSA definition (7) and community county or city information from an atlas (18).

VEHICLE FLEET ANALYSIS

Classification of a utility service area as inside or outside of an EPACT MSA is carried out for three lists of utility companies. At first, two lists — one for NG utilities and the other for electric utilities — are developed. We identify the utilities contained in both lists as "dual utilities" and create a third list of dual utilities, therefore dropping them from the first two lists. Separately, we analyze EIA NG survey data and the Dwight's database to identify NG producers and transporters whose fleets are covered by the Section 501 mandate.

We assign vehicle fleet data from the above-mentioned data sources to the utilities contained in these three lists. First, fleet data from the EIA NG and electric surveys are assigned to the applicable utilities. Fleet data from the AGA/EEI survey are then assigned to the companies for which data were not available from the EIA surveys. Next, data from the *Natural Gas Fuels Magazine* survey are assigned to the remaining companies. Finally, data from the Dwight's database are assigned to some of the remaining companies.

The vehicle fleet data from the four surveys do not provide information for all utilities on the three lists. After the above assignments, some utility companies are still left without fleet vehicle data. In particular, there are 2 dual utilities, 14 electric utilities, and 56 natural gas utilities without fleet vehicle data. We estimate fleet vehicles for these companies with regression relationships, as described in the following sections.

Natural Gas Utilities

Nearly 1,000 utilities distribute NG. A majority of these NG utilities are small, with less than 5,000 customers. We identified 190 NG utilities and 60 dual utilities, a quarter of the total, that serve one or more EPACT MSAs and are potentially covered by EPACT Section 501. Although this number of 250 NG and dual utilities may look small, it includes most of the large utilities.

The next step is to identify the customer base of each utility. The customer base can be used to rank utilities and to establish a relationship between vehicle fleet size and the number of customers served. Customer data are available for most of the utilities from the Brown's Directory (5). In some instances, the Brown's Directory does not have customer information or has information only for the holding company. Also, some NG companies have operations in several states, with a few of the subsidiaries having names different than the parent company. For utilities that serve multiple states, we separate community-level customer data within each state and then aggregate them to the MSA level. When only the community names are available (without the number of customers), we prorate the total customers by using population data (19). While prorating the total customers through community population data, only county- or parish-level customer information is generated, thereby avoiding the time-consuming process of conducting community-level customer assignments. When information on customers and service areas is not available from the Brown's Directory, we contact the respective state utility commissions; when state utility commissions could not provide such information, we contact the utility companies directly.

The customer base of the utilities varied from under 200 to over 4,000,000. Figure 1 shows the distribution of these utilities by number of customers. Dual utilities tend to have a larger customer

base than NG utilities. For example, 34 (59%) of the dual utilities have more than 100,000 customers, compared with 69 (36%) of the NG-only utilities.

FIGURE 1. Distribution of Covered Natural Gas Utilities by Size

Next, we compute the EPACT MSA share of the total customers for each company. We add the number of customers served in the counties, parishes, and cities located in the served EPACT MSA and then compute the ratio of MSA customers to total customers. Assuming that the LDV ratio between the EPACT MSA and all areas is the same as the customer ratio, we estimate LDVs located in the EPACT MSA from the total LDVs owned/operated by the company. Most of the covered utilities have their corporate offices located within EPACT MSAs, requiring some fixed number of LDVs to serve their corporate needs. Also, the level of congestion in metropolitan areas will necessitate allocating more vehicles to an MSA for the same customer base. On the other hand, longer distances and the minimum crew requirements in rural communities would require a disproportionate number of vehicles. We assume that these two conflicting requirements will offset each other, resulting in an allocation similar to our customer-based ratio.

The two NG utility lists (dual and NG-only) were updated with vehicle fleet data from the surveys. EIA's natural gas utilities survey (14) provided vehicle fleet information for 179 utilities, and its electric utilities survey (13) provided information for 4 dual utilities. The 1994 AGA/EEI survey (15) provided information for 3 more utilities, and the survey by the *Natural Gas Fuels Magazine* (16) provided data for 5 utilities. We used the Dwight's Energy Research database (17) to obtain information for 1 utility. The coverage of EPACT Section 501 extends to 60 dual utilities and

190 NG-only utilities. We now had fleet information for 58 of the 60 dual utilities and 134 of the 190 natural gas-only utilities.

An estimation procedure was developed for the 58 utilities for which fleet data were lacking. On the basis of the numbers of LDVs and customers for 72 NG utilities, we established a regression relationship between number of LDVs and number of customers. We applied the regression to estimate LDVs owned/operated by each of the 58 companies. The regression relationship is estimated as follows:

$$\text{LDV} = 15 + 0.0015 \times (\text{no. of customers}).$$

The regression has an R^2 of 0.72. The standard errors of the estimated intercept and customer coefficient are 8.6 and 0.0001, respectively. Figure 2 shows the data on which the regression equation is based and the regression line.

FIGURE 2. Estimation of the Vehicle Fleet Data for the Missing Natural Gas Utilities

The utilities lists were checked again to remove those that had less than 20 vehicles in an EPACT MSA. Our final estimates show that 68 utilities, including 5 dual utilities, have less than 20 LDVs in EPACT MSAs and will not be covered under the mandate. We eliminate these 68 utilities, reducing the number of utilities that will be subjected to EPACT Section 501 mandate to 182. The final list contains 55 dual utilities and 127 NG-only utilities.

The 182 natural gas utilities covered by EPACT Section 501 represent 18% of the total number of NG utilities. The 127 NG-only companies together own/operate 38,100 LDVs, of which 30,050 LDVs are covered by the Section 501 mandate. The NG-only utilities own a substantial number of AFVs, representing 19.4% of the total LDVs (Table 2). NG and liquid petroleum gas (LPG) vehicles account for 98% of the AFVs. The 55 dual utilities own/operate 41,100 LDVs, of which 33,400 are covered by the Section 501 mandate. AFVs represent 10.0% of their total LDV fleet.

Questions relating to new-vehicle purchases, in terms of vehicle acquisition and the type of fuel the newly acquired vehicle is capable of using, were included in the EIA's natural gas providers survey. We analyzed these data to ascertain the new-vehicle purchase patterns that NG-only and dual utilities are most likely to follow. The NG utilities that serve the EPACT MSA were analyzed in particular. The NG-only utilities reported new-vehicle purchases representing 13.8% of the existing LDV stock and dual utilities 10% (Table 2). This new vehicle share for the NG-only utilities is slightly higher than the share reported by the AGA. AGA summarized the 1994/1995 vehicle purchase profile of 47 natural gas and electric utilities (20) in which the 1994 purchases of new light-duty vehicles represented 12.6% of the fleet and the 1995 purchases represented 11.6% of the fleet. The difference is likely to be due to the inclusion of dual utilities in the AGA estimates.

TABLE 2. Characteristics of NG-Only and Dual-Utility Vehicle Fleets and New Purchases^a

Category	Cars	LDTs	LDVs	HDTs	All
NG Utilities					
Existing Stock (% of total fleet)	19.4	57.1	76.5	23.5	100
New Purchase (% within each group)	14.3	13.6	13.8	8.6	12.5
AFVs (% within each group)	10.8	22.4	19.4	13.4	17.9
Dual Utilities					
Existing Stock (% of total fleet)	21.4	45.9	67.3	32.7	100
New Purchase (% within each group)	7.7	11.1	10.0	8.0	9.4
AFVs (% within each group)	2.8	13.4	10.0	2.4	7.5

^a Data limited to EIA's Natural Gas Provider Fleet Survey.

Note: Numbers for LDVs are totals or averages of the numbers for cars and LDTs.

NG Producers and Transporters

NG producers and transporters operate separately from the NG utilities. Many of them are owned and operated by holding companies that also own NG utilities. Both of these NG providers, producers and transporters, have their activities scattered over wide areas. We obtained the geographic location information from the Brown's Directory (5) and EIA's Natural Gas Annual Supplement (8) to ascertain the coverage of EPACT Section 501.

EIA's survey (10) includes fleet data for NG producers and transporters. The survey provides data for each state in which they operate. Nearly 200 NG producer and transporter vehicle fleets are included in the survey. We examined the data and eliminated vehicle fleets that were not located in an MSA and those with less than 20 light-duty vehicles. We examined information

regarding the remaining producers and transporters (5,9) and identified 63 producer and transporter fleets that will be covered by EPACT Section 501. These fleets contain 9,700 light-duty vehicles, of which 7% are AFVs. Table 3 lists the characteristics of these fleets.

TABLE 3. Characteristics of the Covered Natural Gas Producer and Transporter Fleets and New Purchases

Category	Cars	LDTs	LDVs	HDTs	All
Existing Stock (% of total fleet)	21.4	64.8	86.2	13.8	100
New Purchases (% within each group)	14.6	16.2	15.8	9.8	14.9
AFV (% within each group)	3.3	8.2	7.0	6.8	6.9

While analyzing the vehicle fleet data for producers and transporters, we relied on the location of the reporting entity within the state for which the data are reported. We excluded the vehicle fleet when its location in an EPACT MSA was in doubt. This process may have resulted in a slightly conservative estimate of the covered vehicles.

On the basis of 1994 new-vehicle purchases, the covered producers and transporters will replace 15.8% of the light-duty vehicles annually. The estimated numbers of AFV that will be purchased under the EPACT Section 501 mandate are 460 in 1996, 760 in 1997, 1,070 in 1998, and 1,380 in 1999 and thereafter.

Electric Utilities

For the electric utility companies, we used the population data to allocate vehicles between EPACT MSA and other areas. The *Directory of Electric Utilities* (6) provides the population information for each town served by an electric utility. In the instances when such population information was not available, we identified the counties served. We contacted state public utility commissions and individual companies for information relating to the counties served.

Figure 3 shows the distribution of the EPACT-covered electric utility companies by size (in terms of the amount of kWh of electricity sold or handled). As the figure shows, about 20% of the companies have sales in the range of 20 to 80 billion kWh per year. Nearly 80% of the covered electric companies sell or handle electricity in an amount below 20 billion kWh per year. Among these companies, 50% have sales or operations below 2 billion kWh per year, and virtually all are municipal or cooperative companies.

For utility companies that serve more than one MSA, we allocated the total fleet vehicles to each of them and then determined the possible EPACT coverage on the basis of the number of vehicles in each MSA. We eliminated an MSA (and the company if it served that MSA only) when the number of vehicles in it was less than 20.

FIGURE 3. Distribution of Electric Utilities by Electricity Sales

On the basis of our analysis of the EIA survey data, we determined that 173 electric companies are subject to the EPACT 501 requirement. Of these 173 companies, 128 are electric-only and 45 are dual companies. We also identified 31 additional electric companies that are potentially covered by the EPACT Section 501 from the three supplementary data sources. Among them, 14 companies were from the AGA/EEI survey, 14 from the Dwight's database, and 3 from the *Natural Gas Fuels Magazine* survey. In summary, we identified a total of 204 electric utility companies, including 45 dual utilities, that will be covered by the EPACT Section 501 requirements.

We did not find any fleet information for some large electric utility companies from any of the four data sources. In particular, fleet data for 14 large electric companies with electricity sales of more than 1 billion kWh a year are missing. Using the data for 148 electric companies, we established a regression relationship between the number of fleet vehicles and the amount of electricity sold. We applied the relationship to estimate the number of fleet vehicles for each of the 14 missing companies. The regression relationship is presented below.

$$\text{LDV} = 3.41 \times 10^{-8} \times (\text{annual kWh}).$$

The relationship has an R^2 of 0.64. The standard error of the coefficient is 1.66×10^{-9} . Figure 4 shows the data on which the regression equation is based and the regression line.

Table 4 presents the characteristics of vehicle fleets in electric utilities from the EIA surveys. As the table shows, LDTs (vans, pickups, and sport utility) account for 43.1% of the total electric-utility fleet, HDTs 37.7%, and cars the remaining 19.2%. On average, new purchases of LDVs (cars and LDTs) represent 10.5% of the existing fleet. The new purchases share is much smaller for HDTs, meaning that HDTs last longer in electric utility fleets. AFVs account for only a small fraction of the existing fleet: 0.8% of the passenger cars, 2.0% of the LDTs, and 0.8% of the HDTs.

FIGURE 4. Estimated Number of Fleet Vehicles for the Missing Electric Utilities

TABLE 4. Characteristics of Electric Utility Vehicle Fleets

Category	Cars	LDTs	LDVs	HDTs	All
Exist Stock (% of total fleet)	19.2	43.1	62.3	37.7	100.0
New Purchase (% within each group)	10.2	10.7	10.5	6.4	9.0
AFVs (% within each group)	0.8	2.0	1.6	0.8	1.3

Note: Numbers for LDVs are totals or averages of the numbers for cars and LDTs.

When electric-only companies with less than 20 vehicles and already counted dual utilities are eliminated, we estimate that 166 electric companies are covered by the EPACT Section 501 requirements. Of the 166 covered companies, vehicle data for 129 companies are from the EIA electric survey, 13 from the Dwight's database, 10 from the AGA/EEI survey, and 14 are from our regression estimates. These 166 companies together own or operate 74,300 LDVs, of which 58,500 LDVs are covered by the EPACT Section 501 requirements.

The above estimated fleet vehicles covered by the EPACT Section 501 requirements may under-represent the actual covered fleet vehicles for at least two reasons. First, some federal power agencies, such as the Bonneville Power Administration and Tennessee Valley Authority, are excluded in our estimation, because it is not clear whether these agencies will be covered through either the Section 501 requirements as fuel providers or through some other requirements applied

to federal agencies. Second, even though we have estimated, through the regression relationship, the number of fleet vehicles for 14 large electric companies with missing fleet-vehicle data, there are still many electric companies that are missing from the four data sources and for which we have not estimated the numbers of fleet vehicles.

PROJECTED AFV PURCHASES UNDER EPACT 501

Through the above analysis, we now have the existing LDV stocks and new purchases shares for the NG and electric industries. Table 5 summarizes the existing vehicle stocks and new purchases shares for each of the groups.

TABLE 5. Estimated EPACT-Covered Existing Fleet LDV and New Purchases

Category	NG Utilities	Dual Utilities	NG Producers & Transporters	Electric Utilities
Covered No. of Companies	127	55	63	166
Covered LDV Stock	30,050	33,400	9,700	58,500
New Purchases (% of stock)	13.8	10.0	15.8	10.5

We now project AFV purchases to meet the EPACT Section 501 requirements. Because the NG providers can, and will be likely to, purchase gaseous-fuel AFVs to meet the requirements, they should start their AFV purchases in 1996. Electric companies are likely to choose to purchase EVs to meet the requirements and thus qualify for a two-year delay. They will start to purchase EVs in 1998. By using the total covered LDV, new vehicle purchases as the percentage of total LDV, and the EPACT Section 501 schedule of AFV acquisition, we project AFV purchases for the NG and electric industries (Table 6).

TABLE 6. Projected AFV Purchases to Meet the EPACT 501 Requirements

Model Year	NG Utilities	Dual Utilities	NG Producers & Transporters	Electric Industry	Total
1996	1,250	1,000	460	0	2,710
1997	2,070	1,670	760	0	4,500
1998	2,910	2,340	1,070	1,840	8,160
1999	3,730	3,010	1,380	3,070	11,190
2000	3,730	3,010	1,380	4,300	12,420
2001 and up	3,730	3,010	1,380	5,530	13,650

CONCLUSIONS

Relying on four surveys/databases, we estimate that 127 NG utility companies, 55 dual-utility companies, 63 NG producer/transporter fleets, and 166 electric utility companies will be covered. These 411 companies together own/operate a total of about 132,000 LDVs. Among the four groups, the electric utilities have the largest covered LDV stock, the dual utilities have the next largest stock, and the NG producers/transporters have the smallest stock.

Each of the four groups already owns and operates AFVs and is familiar with their characteristics. The AFV share varies between the four groups, with the NG utilities having 19.4%, the dual utilities 10.0%, NG producers/transporters 7.0%, and the electric utilities a paltry 1.6%. For NG and dual utilities and NG producers/transporters, a majority of AFVs use compressed natural gas or liquified petroleum gas. The rate of vehicle replacement also varies among the groups, with new LDV purchases accounting for 13.8% of the existing vehicles for the NG utilities, 10.0% for the dual utilities, 15.8% for the NG producers/transporters, and 10.5% for the electric utilities, implying that the dual and electric utilities keep their LDVs longer.

On the basis of the analysis of the existing LDV stocks, new LDV purchases, and the Section 501-mandated AFV acquisition schedule, we have projected the number of AFVs required to be purchased annually by the covered NG and electricity providers. We project the AFV purchases as 2,710 in 1996, 4,500 in 1997, 8,160 in 1998, 11,190 in 1999, 12,420 in 2000, and 13,650 in 2001. If the NG and electricity providers are allowed to use their already-owned AFVs toward meeting the Section 501 requirements, we expect that NG providers will need to expend little additional effort because they already have a significant portion of their existing fleets as AFVs. On the other hand, electric companies, with less than 2% of their fleets as AFVs, will have to make substantial efforts to meet the requirements.

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