# Electrification of Transportation and Tax Losses for Turkey: An Exercise

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# ELECTRIFICATION OF TRANSPORTATION AND TAX LOSSES FOR TURKEY: AN EXERCISE

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This report aims to study how the electrification of transportation means in major cities of Turkey affect the amount of tax obtained from the purchase of fuels. The objective of the report is to roughly calculate how much tax would be lost if taxis, public buses and automobiles in Istanbul, Ankara, Izmir, Bursa and Konya were electrified to a degree. The simulation results suggests that the tax revenue will be loss will be around 1.64% - 6.48% of the central government's tax revenues.

The assumptions are made about electrification based on current situations regarding automobiles, taxis and public buses. Simulations are run under base, lowest and highest scenarios. These assumptions are demonstrated in Table 1.

Table 1: Basic Assumption for Calculations

| | Low | | Base | | High | |
|---|---|---|---|---|---|---|
| | Electrification | Daily Fuel Consumption (TL) | Electrification | Daily Fuel Consumption (TL) | Electrification | Daily Fuel Consumption (TL) |
| **Taxi** | | | | | | |
| Gasoline | 15% | 150 | 20% | 200 | 30% | 250 |
| Diesel | 15% | 100 | 20% | 150 | 30% | 200 |
| LPG | 10% | 50 | 15% | 100 | 20% | 150 |
| **Bus** | 10% | 300 | 15% | 350 | 20% | 400 |
| **Automobile** | | | | | | |
| Gasoline | 15% | 15 | 20% | 20 | %30 | 25 |
| Diesel | 10% | 10 | 15% | 15 | %20 | 20 |
| LPG | 5% | 5 | 10% | 10 | %15 | 15 |

Table 2: Istanbul-Ankara-Izmir-Bursa-Konya Outlooks on Electric Vehicles

| | Number of Vehicles | Base-Scenario Annual Fuel Consumption (Million TL) | Base-Scenario Tax Revenue (2018) (Million TL)[1] | Low-Scenario Tax Loss After Electrification (Million TL) | Base-Scenario Tax Loss After Electrification (Million TL) | High-Scenario Tax Loss After Electrification (Million TL) |
|---|---|---|---|---|---|---|
| **Taxi** | 29.806 | | | | | |
| Gasoline | 4.967 | 363 | 184 | 21 | 37 | 69 |
| Diesel | 9.935 | 544 | 234 | 23 | 47 | 93 |
| LPG | 14.904 | 544 | 197 | 10 | 30 | 59 |
| **Bus[2]** | 7.586 | 969 | 416 | 36 | 62 | 95 |
| **Automobile[3]** | 12.412.000 | | | | | |
| Gasoline | 3.086.000 | 22.538 | 11.422 | 1.286 | 2.284 | 4.281 |
| Diesel | 4.622.000 | 23.305 | 10.864 | 724 | 1.630 | 2.898 |
| LPG | 4.704.000 | 17.170 | 6.233 | 155 | 623 | 1.404 |
| **Total** | | 67.422 | 29.550 | 2.254 | 4.713 | 8.900 |
| **Percentage to Annual Tax Income** | | | | 1.64% | 3.43% | 6.48% |

Source: **Number of taxis by each city** (Istanbul: https://www.dunyaenerji.org.tr/istanbul-taksilerinde-d-segmente-gecisin-akaryakit-talebine-etkisi/, Ankara: https://sonsoz.com.tr/ankarada-new-yorktan-fazla-taksi-var/, Izmir: https://www.yeniasir.com.tr/ekonomi/2018/03/06/izmire-para-taksiyle-geliyor, Bursa: https://www.bursahaberdar.com/ozel-haber/ulasimin-olmazsa-olmazi-taksi-ve-dolmuslar-h2371.html, Konya: https://www.bik.gov.tr/nufus-artiyor-taksici-artmiyor/). **Number of buses** (Istanbul: https://www.iett.istanbul/tr/main/pages/otobus-filosu/85, Ankara: http://www.hurriyet.com.tr/yerel-haberler/ankara/ego-2018-yilinda-354-milyon-yolcu-tasidi-41107048, Izmir: https://medium.com/@erkinalp/izmirde-bazı-toplu-ulaşım-sorunları-3d6aea9e9f82, Bursa: https://www.burulas.com.tr/otobus-genel-bilgiler.aspx, Konya: http://atus.konya.bel.tr/topluulasimfilo.php?langCode=tr). **Number of automobiles, number of automobiles by fuel type** (TurkStat, Road Motor Vehicles, May 2018). **Fuel prices** (EPDK, LPG Piyasası Yıllık Sektör Raporu, 2018), (EPDK, Petrol Piyasası Yıllık Sektör Raporu, 2018).

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[1] The total tax revenue in 2018.

[2] It is assumed that all public buses use diesel.

[3] Number of automobiles by both fuel type and cities couldn't be found. Therefore the number represents total of Turkey.

**Appendix:**

Annual fuel consumption is found by;

Number of vehicles x 365 x Average daily price of fuel

Tax revenue is found by;

Annual fuel consumption x 365 x Average daily tax price of fuel

Tax loss after electrification is found by;

(Number of vehicles x percentage of electrification) x 365 x tax price of each fuel)