

Evaluating the effect of Subsidy Removal on Nigerian Consumers: Strategies to Alleviate the Effect

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Abstract

This study examined the impact of Nigeria's fuel subsidy removal on consumers, focusing on the role of strategic investments in public transportation, renewable energy, and social safety nets. Using a cross-sectional survey design, data were collected from a diverse population in Delta State, including business owners, employees, household customers, and immigrants, to assess how these strategies can mitigate the adverse effects of subsidy removal. The findings revealed that investments in public transportation, renewable energy, and social safety nets significantly and positively influence consumer welfare, underscoring their importance in addressing the economic challenges associated with the policy shift. The study concludes that enhancing public transportation infrastructure, increasing renewable energy investments, and strengthening social safety nets are crucial for supporting Nigerian consumers during the transition away from fuel subsidies. These measures not only alleviate the immediate financial burden on the population but also contribute to long-term economic stability and sustainability. The Nigerian government is recommended to prioritize these strategic investments to foster a more resilient economy and improve the quality of life for its citizens.

Keywords: Fuel Subsidy Removal, Public Transportation, Renewable Energy, Social Safety Nets

1.0 Introduction

Nigeria is endowed with a wealth of natural resources, among which crude oil stands out as highly significant. As the leading crude oil producer in Africa, Nigeria's oil industry plays a critical role in its economy. However, the country faces a major challenge in its inability to process crude oil to meet domestic demand for refined petroleum. Instead, Nigeria exports unrefined crude to industrialized nations for processing, only to import the refined products back into the country. In 2019, Nigeria had a proven crude oil reserve of approximately 36,890 million barrels and a daily output of 1,737.4 thousand barrels per day, as reported by OPEC in 2020. Despite these figures, Nigeria's domestic capacity for refined oil production remains insufficient to satisfy its needs. In 2018, Nigeria imported 442 thousand barrels per day of refined oil, while its domestic refining capacity was just 344 thousand barrels per day, according to the Energy Information Administration (EIA) in 2020 and BP in 2020. This deficit in refining capacity has long plagued the country, with crude oil refineries operating at well below their potential. For instance, in 2009 and 2010, Nigeria met only 15% of its domestic demand for refined petroleum, relying heavily on imports to fill the gap (Siddig et al., 2014). To mitigate the economic strain caused by high importation costs, the Nigerian government introduced a fuel subsidy. This policy aimed to stabilize and reduce the impact of volatile global gasoline prices on the domestic economy.

However, the subsidy has also imposed a significant financial burden on the government, especially as global fuel prices and domestic demand for refined oil have risen (Okorie & Wesseh, 2024). Various administrations have attempted to eliminate the fuel subsidy, such as President Goodluck Jonathan's effort in 2012. However, removing the subsidy poses challenges, particularly for economically disadvantaged populations who benefit from stable fuel prices, while the primary beneficiaries of the subsidy are oil importers and wholesalers who exploit the system for profit (The Economist, 2012; The Economist, 2011).

Similar challenges are faced by other African oil-exporting nations. Globally, there has been a push to reduce fossil fuel subsidies, leading to higher prices for goods and services and encouraging a shift toward alternative, low-carbon energy sources. This includes increased use of renewable energy and improvements in energy efficiency. The elimination of the fuel subsidy in Nigeria in 2023 marks a significant turning point with wide-ranging economic, social, and environmental implications (Evans et al., 2023). This policy shift has sparked debate, particularly concerning its potential impact on inflation and consumer prices. The Consumer Price Index (CPI), which measures the rate of change in the prices of goods and services, is a crucial metric in this discussion. In May 2023, Nigeria's CPI rose to 22.41 percent, marking the fifth consecutive increase in the country's inflation rate that year (NBS, 2023).

Current research on the impact of fuel subsidy removal largely focuses on developed economies, leaving gaps in understanding its effects in developing nations like Nigeria. This study aims to address these gaps by exploring how greater investment in public transportation, renewable energy sources, and social safety nets can help mitigate the negative consequences of subsidy removal. Specifically, this paper introduces the *IPTIREISSN* model to analyze the economic, energy, and environmental impacts of subsidy removal on Nigerian consumers. The model predicts that removing the fuel subsidy will reduce the welfare of Nigerian consumers. While the subsidy primarily benefits the poor by stabilizing fuel prices, it also enables refined oil importers and wholesalers to profit by smuggling subsidized fuel to neighboring countries (Siddig et al., 2014). Comparative studies from other countries, such as Bangladesh, have shown that removing subsidies can boost overall production and economic welfare (Timilsina & Sheoli, 2020). However, other studies indicate that subsidy removal can lead to higher prices, potentially reducing overall welfare and negatively affecting households and businesses (Wesseh & Lin, 2016; Pradhan & Ghosh, 2019; Dennis, 2016; Zhang & Vigne, 2021; Rentschler et al., 2017).

The removal of subsidies in Nigeria will have a significant impact on consumers, particularly in the short term. Prices of essential goods and services, such as fuel, electricity, and food, are expected to rise sharply. This will lead to a decrease in the purchasing power of consumers, as their disposable income will be reduced. Low- and middle-income households, who already struggle to make ends meet, will be disproportionately affected. In the long term, the removal of subsidies is expected to lead to increased investment in key sectors, such as petroleum and power, as the government will no longer be burdened with the cost of subsidizing these industries. This could lead to improved efficiency and increased production, which may eventually result in lower prices. However, this will depend on various factors, including the effectiveness of government policies and the ability of industries to adapt to the new market realities. To mitigate the adverse effects of subsidy removal, this study suggests alternative policies to enhance Nigeria's economy. By examining the implications of the 2023 fuel subsidy removal, this paper aims to provide insights that are relevant not only to Nigeria but also to other emerging economies facing similar challenges.

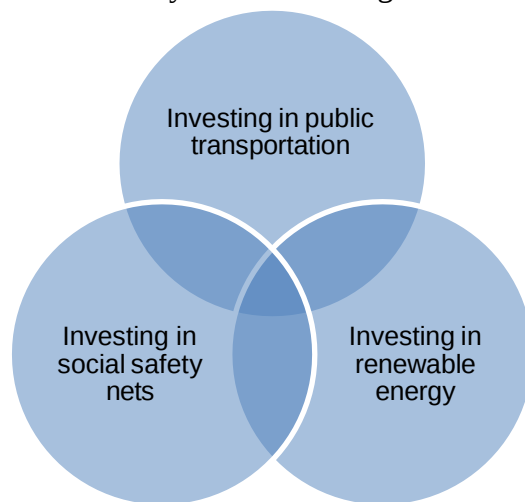
The study's specific objectives include assessing the role of increased investment in public transportation, exploring the potential of renewable energy sources, and investigating the effectiveness of social safety nets in cushioning the impact of subsidy removal on vulnerable populations.

2.0 Review of Related Literature

Subsidy Removal

Fuel subsidy removal refers to the elimination or reduction of government-funded subsidies on fuel products, such as gasoline, diesel, and kerosene. These subsidies are typically provided to keep fuel prices artificially low, making them more affordable for consumers. However, removing or reducing these subsidies allows fuel prices to reflect their true market value, increasing the cost of fuel for consumers. The decision to remove subsidies in 2023 demonstrates the Nigerian government's ongoing commitment to tackle economic difficulties and streamline expenditure on subsidies. The 2012 scenario demonstrated a strategic effort to alleviate the financial strain and reallocate resources towards developmental projects (Ude, 2023). Nevertheless, this latest move stands out by conforming to the manifestos of the prominent presidential candidates prior to the 2023 election, signifying a political agreement on the importance of reform (Al Jazeera, 2023). This demonstrates a more deliberate and methodical approach in contrast to the abrupt announcement made in 2012. The reaction from individuals in both instances highlights their reliance on subsidies and the perceived influence on their financial well. In 2012, there were large protests that occurred as a result of the suddenness of the policy change and its direct effect on fuel prices (Houeland, 2020). Similarly, the elimination of fuel subsidies in 2023 caused widespread public disorder as people hurried to buy fuel before prices increased (Al Jazeera, 2023). The responses underscore the crucial impact that subsidies have on the everyday existence of Nigerians. Examining the economic context uncovers certain patterns. Both instances highlight the fact that providing subsidies is not financially sustainable. The 2012 elimination of subsidies was implemented to tackle the rising expenses associated with subsidies, a situation that is reminiscent of the concerns surrounding expanding costs in 2023 (Ude, 2023). Political issues are present in both cases. In 2012, President Goodluck Jonathan's decision to remove subsidies resulted in widespread public outrage and labour unions staging protests, ultimately leading to a partial reversal of the policy (Houeland, 2020). President Bola Ahmed Tinubu declared the elimination of subsidies in 2023, demonstrating his administration's dedication to tackling economic difficulties and preventing such negative public reactions. This implies that the present administration may have assimilated knowledge from previous encounters and embraced a more strategic methodology. The key focus continues to be on the social impact. The 2012 protests underscored the significance of the subsidy as a crucial social safety net, particularly for the susceptible population (Houeland, 2020). Similarly, the decision made in 2023 has aroused concerns about worsening inequality, as a substantial segment of the population resides in a state of multidimensional poverty. The persistence of this continuity highlights the importance of taking into account the effects on the most susceptible portions of the population. Vandeninden et al. (2022) discover that fossil fuel subsidies do not benefit the poor, and eliminating them can create advantageous circumstances. In order to lessen the negative effects of removing subsidies for fossil fuels, several studies have examined effective policy options. These options include improving agricultural productivity and reducing trade transaction costs (Wesseh and Lin, 2017), providing revenue support and transferring funds between different economic sectors (Chatri et al., 2018), and implementing a carbon tax (Jiang et

al., 2020). Figure 1 is an illustration of the strategies to alleviate the effect of subsidy removal on consumers. Investing in public transportation, renewable energy, and social safety nets can help reduce the impact of fuel subsidy removal on Nigerian consumers.



• Figure 1. Strategies to Alleviate the Effect of Subsidy Removal

By expanding public transportation options, individuals will have alternatives to personal vehicles, decreasing fuel consumption and the effects of price increases. Additionally, promoting renewable energy sources can decrease dependence on fossil fuels, reducing the impact of fuel price fluctuations. Implementing social safety nets is crucial to protect vulnerable populations, such as low-income households, from the impact of fuel subsidy removal. Cash transfers, targeted subsidies for essential goods, and expansion of social welfare programs can help cushion the effects of price increases. This ensures that those who need it most receive support during the transition.

Investing in Public Transportation (IPT)

Investments in public transportation refer to the allocation of funds to develop and improve transportation systems that are accessible to the general public. This includes the construction of roads, highways, bridges, and public transit systems such as buses, trains, and subways. The goal of these investments is to provide safe, efficient, and affordable transportation options for commuters, reducing reliance on personal vehicles and decreasing congestion and air pollution. The modern transport infrastructure has been crucial in the economic development of advanced nations. Transportation is commonly referred to as the "lifeline" since it plays a vital role in developing communities and providing possibilities for its residents (Miller, 2014). The correlation between international economies and social and economic progress is evident, as they are propelled by the implementation of effective and efficient transport networks. Periodically, public transport facilitates the movement of individuals between different locations due to socioeconomic factors. During the period of fuel subsidy reduction, it is highly advantageous and crucial to utilise public transportation. The present inflation is mostly caused by the elimination of subsidies, which has led to a significant increase in transit costs. Okpigh (2020) states that the economic and marketing activities that were previously central to the Nigerian economy are seeing a significant decline. Undoubtedly, it is essential to prioritise sustainable and strategic investment in the public transport sector to effectively mitigate the impact of removing this subsidy on customers. In Nigeria, consumers can benefit from inclusive access to transport schemes that are more efficient, inexpensive, and environmentally friendly. This can be achieved by improving and expanding

transport networks that connect rural and urban locations.

According to Leipziger and Lefevre (2015), the advancement and funding of public transport systems necessitate involvement from federal, state, and local governments, but the private sector can also play a crucial part.

Investing in Renewable Energy (IRE)

Investments in renewable energy involve allocating funds to develop and promote energy sources that are sustainable and non-polluting. This includes solar, wind, hydro, geothermal, and biomass energy, among others. These investments can be made in the form of building new renewable energy infrastructure, retrofitting existing infrastructure to increase energy efficiency, or providing incentives for individuals and businesses to adopt renewable energy technologies. Similar to the impact of the COVID-19 outbreak, the elimination of subsidies has had a detrimental effect on the Nigerian economy, exacerbating its already fragile state and significantly impacting the livelihoods of individuals and households. Ata (2015) argues that the development of renewable energy is an important solution to tackle these difficulties. This is because it can meet the future energy demand while reducing the hazards associated with existing energy sources. The removal of gasoline subsidies presents a crucial moment that motivates Nigerians to adopt renewable energy options, including solar electricity. The high expenses associated with fuel-powered generators are causing a growing interest in renewable alternatives. The increase in solar adoption is expected to stimulate significant expansion in the renewable energy industry, providing a more sustainable and economically efficient energy alternative. The power sector in Nigeria is currently at a crucial point, requiring extensive enhancements to ensure the continuity of industrial development. The nation's vast capacity for renewable energy, including as solar and hydro power, offers a revolutionary alternative (Babatunde et al., 2019; Evans, 2023). By utilising these resources, Nigeria has the potential to transform its energy sector, guaranteeing its population dependable and cost-effective access to electricity. Nigeria has the necessary conditions, such as ample sunlight and water supplies, to produce power from renewable sources. One important method to reduce the impact involves expediting the use of compressed natural gas (CNG) as a substitute for traditional fuels. This is in line with the worldwide shift towards cleaner and more cost-effective energy sources. The explicit measures described, such as implementing legislative frameworks, providing financial assistance for the expenses associated with conversion, and easing the availability of compressed natural gas (CNG) at refuelling stations, underscore a comprehensive strategy for fostering this shift.

Investing in Social Safety Nets (ISSN)

Investments in social safety nets refer to the allocation of funds to support vulnerable populations, including the poor, elderly, and those with disabilities. This includes programs such as cash transfers, food assistance, healthcare, education, and housing support. The goal of these investments is to provide a financial safety net for individuals and families, protecting them from poverty and ensuring access to basic necessities during times of economic stress or uncertainty. The proposition to eliminate fuel subsidies in Nigeria while simultaneously implementing comprehensive social safety nets for marginalised populations embodies a multifaceted strategy to tackle the economic, social, and humanitarian issues linked to subsidy reform. According to Yemtsov and Moubarak (2018), the preparedness of social safety nets is essential for effectively reducing the effects of these reforms. Therefore, it is crucial to examine a range of approaches that not only reduce the hardship experienced by the impoverished but also enable a gradual shift away from subsidisation. The significance of raising the minimum wage to mitigate the consequences of subsidy elimination is underscored, mirroring the viewpoint of Akinola (2018).

Increasing the minimum wage would assist individuals, particularly those with lower incomes, in better managing the higher transit expenses that arise from the elimination of subsidies. The suggestion to re-examine compensation systems by employers highlights the need for joint efforts from both the public and private sectors to safeguard workers who are at risk. Failure to provide compensation might result in an extra 7.1 million individuals being forced into poverty, worsening an already severe situation (World Bank, 2023). This is consistent with the results of a study conducted by Mmadu and Akan (2013), which examined the effects of ineffective subsidies in the oil industry on the well-being of households. Moreover, the elimination of subsidies can result in significant adaptation strategies among recently impoverished and financially vulnerable households. These techniques may involve reducing vital services like education and healthcare, or making compromises on dietary choices (World Bank, 2023). In order to alleviate the negative impacts on susceptible groups, the World Bank highlights the importance of implementing sufficient compensation and transfer channels. Compensating payments can protect households from the initial price effects of subsidy reform and offer crucial assistance to those who are at risk of sinking further into poverty.

2.1 Theoretical Framework

Economic theories are essential for comprehending the economic consequences of subsidy elimination. The Rational Choice Theory is a concept that suggests individuals make decisions based on maximising their own self-interests while considering limitations (Van Valkengoed & Van der Werff, 2022). Within the framework of subsidy elimination, this theory elucidates the manner in which consumers respond to price hikes by modifying their purchasing habits. The 2012 subsidy removal demonstrations in Nigeria resulted in changes in consumer behaviour as a result of rapid increases in petrol prices, as indicated by data collected by Apeloko and Olajide (2012).

2.2 Empirical Studies

Okorie and Wesseh (2024) investigated the effects of eliminating fossil fuel subsidies on economic well-being and environmental conditions using several policy approaches. Examining the 2020 subsidy reform in Nigeria, the findings indicate that while eliminating subsidies on fossil fuels enhances environmental conditions, it has adverse effects on the financial prosperity of economic actors and leads to an overall increase in prices. De Bruin and Yakut (2023) investigated the consequences of eliminating subsidies for fossil fuels and implementing higher carbon taxes in Ireland. By employing a dynamic intertemporal computable general equilibrium (CGE) model specific to Ireland, we conduct a comparative analysis on the effects of eliminating eight subsidies for fossil fuels in Ireland and raising the carbon price to €100 per tonne by the year 2030. Our analysis reveals that both programs yield comparable reductions in emissions. Implementing carbon pricing leads to reduced negative effects on GDP and investment, while removing subsidies leads to decreased negative effects on employment, increased revenue, an improved trade balance, and reduced debt. In their study, Hanyurwumutima and Gumede (2021) examined the influence of public transit on the economic growth of South Africa. The study utilised secondary data. The results indicate a significant deviation from the findings of prior research on transport expenses and the economic development of South Africa. This analysis, however, validated the necessity of augmenting investments in public transit infrastructure. Banji et al. (2020) evaluated the obstacles and advantages associated with renewable energy in Nigeria. This article examined the current status of key renewable energy sources in Nigeria, including solar, large hydro, small hydro, biomass, and wind. It discussed the existing problems and the advantages connected with these technologies. The study revealed that renewable energy makes up a significant portion of the nation's electricity supply, with the vast majority of the installed capacity coming from

hydropower. The remaining contribution is derived from sources such as solar, wind, and bioenergy.

3.0 Methodology

The study adopted a cross-sectional survey research design, which was chosen for its ability to capture data from a specific point in time, allowing for an efficient examination of the immediate effects of subsidy removal on a diverse population. This design was particularly suitable for the study because it enabled the collection of data from various groups, including business owners, employees, customers, and immigrants in Delta State, who were directly impacted by the Nigerian government's subsidy removal program. The population size was unknown, so the Cochran (1977) formula was applied to determine an appropriate sample size (384), ensuring that the study's findings could be generalized to the larger population. The use of simple random sampling further strengthened the study's validity by minimizing selection bias and ensuring that every individual in the population had an equal chance of being included in the sample.

To gather data, the study employed a structured questionnaire using a Likert scale format, which is ideal for measuring attitudes, perceptions, and the intensity of respondents' opinions on the subsidy removal. The reliability of the research instrument was assessed using the internal consistency reliability approach, ensuring that the questionnaire consistently measured the intended variables. Descriptive statistics were used to analyze respondents' profiles, providing a clear understanding of the demographic characteristics of the sample. Multiple regression analysis was chosen to examine the relationships between the variables, offering insights into the statistical significance of these associations. The analysis was conducted using SPSS for Windows, version 25, a statistical software known for its robustness in handling complex data analyses, thus ensuring the accuracy and reliability of the study's findings.

3.1 Model Specification

The general equation to predict

$$NC = F(IPT, IRE, SSN) \dots \dots \dots 1$$

$$NC = \beta_0 + \beta_1 IPT + \beta_2 IRE + \beta_3 SSN + \varepsilon \dots \dots \dots 2$$

Where:

NC = Nigerian Consumers

IPT = Investing in Public Transportation

IRE = Investing in Renewable Energy

SSN = Investing in Social Safety Nets

4.0 Results of Data Analysis

Out of the 384 questionnaires distributed, 373 were returned. However, 3 of these were incomplete, resulting in a total of 370 usable responses. Consequently, the study proceeded with a high response rate of 96%.

Table 1: Analysis of Respondents Profile

S/N	Variables	Frequency	Percentage (%)
1	Gender:		
	Male	170	46
	Female	200	54
2	Age Range: 18-30	67	18

	31-40	70	19
	41-50	118	32
	Above 51	115	31
3	Marital Status:		
	Single	89	24
	Married	263	71
	Divorced	18	5
4	Educational Qualification		
	School Cert. or O-Level	52	14
	OND/NCE	100	27
	HND/ BSc	130	35
	MSc/MBA	56	15
	Ph.D	32	9

Source: Field Survey, 2024.

As shown in Table 1, the sample consisted of 46% males and 54% females. The age distribution of the respondents indicated that 18% were between 18 and 30 years old, 19% were aged 31 to 40, 32% were between 41 and 50, and 31% were over 51 years old. Regarding marital status, 24% of respondents were unmarried, 71% were married, and 5% were divorced. In terms of educational background, the analysis revealed that the majority, 35% of the participants, held HND/B.Sc qualifications.

Table 2 Strategies to Alleviate the Effect of Subsidy Removal

Predictors	Standardized Coefficients			Collinearity Statistics		ANOVA ^a		Model Summary	
	Beta	T	Sig.	Tolerance	VIF	F	Sig.	R Square	Adjusted R Square
						86.310	.000 ^b	.414	.410
1(Constant)		-.531	.596						
Investing in public transportation	.359	8.048	.000	.803	1.245				
Investing in renewable energy	.171	4.010	.000	.884	1.131				
Investing in Social safety nets	.329	6.973	.000	.719	1.391				

a. Dependent Variable: Nigerian consumers

b. Predictors: (Constant), Investing in public transportation, Investing in renewable energy, Investing in Social safety nets

Source: Field Survey (2024)

Table 2 shows that investing in public transportation positively impacts Nigerian consumers ($\beta = 0.359$, $p < 0.05$). Similarly, investing in renewable energy has a positive effect on Nigerian consumers ($\beta = 0.171$, $p < 0.05$), as does the provision of social safety nets ($\beta = 0.329$, $p < 0.05$).

The analysis confirms no multicollinearity issues, as the Variance Inflation Factors (VIF) for the mitigation strategies are all below the threshold of 10, with tolerance levels exceeding 0.1. The strategies to mitigate the impact of subsidy removal were reliable predictors, as supported by an F value of 86.310 and a p-value of 0.000, which is below the significance level of 0.05, indicating the model's statistical significance. Additionally, these strategies were significant in explaining variations among Nigerian consumers, as evidenced by an adjusted R square value of 0.410, meaning they accounted for 41% of the variations.

4.1 Results and Discussions

The findings indicated that investment in public transportation ($\beta = 0.359$, $p < 0.05$), renewable energy ($\beta = 0.171$, $p < 0.05$), and social safety nets ($\beta = 0.329$, $p < 0.05$) all positively impact Nigerian consumers. This aligns with the analysis by Hanyurwumutima and Gumede (2021), which underscores the importance of increasing investments in public transport infrastructure. Additionally, Banji et al. (2020) discovered that renewable energy makes up a significant portion of the nation's electricity supply, with the vast majority of the installed capacity coming from hydropower. The remaining contribution is derived from sources such as solar, wind, and bioenergy. Furthermore, Yemtsov and Moubarak (2018) emphasize that well-designed social safety nets are crucial in mitigating the adverse effects of such reforms. The positive effects of investing in public transportation, renewable energy, and social safety nets highlight the critical role these strategies play in buffering Nigerian consumers against the challenges posed by subsidy removal. The findings suggest that enhancing public transportation can reduce the burden of increased fuel costs, while investing in renewable energy can decrease reliance on traditional fuels, thereby stabilizing energy prices. Additionally, establishing robust social safety nets can protect vulnerable groups from the economic shocks associated with such policy changes.

5.0 Conclusion and Recommendations

The study concludes that strategic investments in public transportation, renewable energy, and social safety nets are vital in mitigating the negative effects of subsidy removal on Nigerian consumers. These interventions not only support economic stability but also improve the quality of life for the affected population. At the long run the removal of fuel subsidies in Nigeria will offer numerous benefits, including increased government revenue, efficient resource allocation, and reduced dependence on oil exports. It also encourages private sector investment, promotes energy efficiency, and reduces smuggling and corruption associated with subsidized goods. Furthermore, subsidy removal aligns Nigeria with global best practices, promoting a market-driven economy and increasing the country's competitiveness. Subsidy removal can lead to a more sustainable and equitable energy sector, driving long-term economic growth and development, while also generating revenue for critical sectors such as education, healthcare, and infrastructure.

Recommendations

The Nigerian government should prioritize increasing investments in public transportation infrastructure and renewable energy sources to reduce dependence on imported refined oil and to ensure sustainable energy supply. Additionally, the government should strengthen social safety nets to provide adequate support for vulnerable populations, thereby minimizing the socio-economic impacts of subsidy removal. Implementing these measures will foster a more resilient economy and promote long-term sustainability.

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