

The Impact of National Energy Policies in the Rationalization of Fuel Consumption

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Abstract:

In Algeria, fuel consumption of has been growing steadily for many years. This upward trend correlated mainly to a booming national economic situation will inevitably lead to additional energy resource needs, the objective of this article is to highlight the instruments of the national energy policy for the rationalization of fuel consumption. We will measure the impact of these measures on fuel consumption.

Keywords: Energy policy; rationalize; Fuel Demand; LPG fuel.

JEL Classification Codes: L5; L51; L510.

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Introduction:

In Algeria, fuel consumption has been growing steadily and continuously for many years. It has increased from 600,000 tonnes in 1964 to approximately 5.76 million tonnes in 2000 to reach 14.42 million tonnes in 2021. This strong demand is mainly due to the sustained growth in economic activity. During the period 1968–1980 the average growth rate of fuel consumption reached 11%. Indeed, after independence Algeria embarked on a vast program for economic development and fuel needs were significant. In the early 1980s the average growth rate rose to 7%. This is explained by the maintenance of a relatively high rate of consumption by households and the transport sector, reflecting a slowdown in investment compared to the previous period. During the 1985-1990 period, the consumption of land fuels fell by 1.5% compared to the 1980-1985 period due to the collapse in the price of oil which led to a slowdown in the country's economic activity. Indeed, the collapse of the price of oil below ten (10) dollars per barrel, led to the massive recourse to external debt, which increased debt service and worsened the economic situation of the country. During the period 1990-1994, the consumption of land fuels experienced an average decline of 2% per year due to the country's economic situation. Indeed, there were significant changes from 1991 with the rescheduling of the external debt with the assistance of the World Bank (IBRD), then the application of the Structural Adjustment Plan (SAP) with its economic and social (unemployment, decline in demand, etc.). This downward trend continued during the period of the Structural Adjustment Plan (SAP) (1994-1997) before the return to growth from 1998 but with low rates which did not exceed 2.5% at the end of the previous decade. The recovery in demand from 2001 was fueled by the efforts made in the monetary and budgetary fields for economic growth (Recovery Plan for Economic Growth) combined with an international situation characterized by significant economic growth and a price of high oil. During the period 2002-2021, the growth in average consumption of land fuels reached 4% and is expected to increase further over the next few years.

The main question of our research problem is to know:

What are the regulatory and institutional instruments that were implemented by the Public authorities to establish their energy management policy and particularly in the transportation sector? What were the outcomes of these actions to holdback fuel consumption?

To this question we formulate the following hypothesis:

The Public Authorities have implemented institutional and regulatory measures to support an Energy Policy focused on the control and rationalization of fuel consumption.

1- National legislative context

In the mid-1980s, the energy sector had undertaken an overhaul of the legal and institutional structure of upstream oil, which enabled a revival of hydrocarbon exploration and production activities. This first reform of the sector led to an increase in oil reserves and production, which doubled compared to its level at the time of the promulgation of law n° 86-14 of August 19, 1986, relating to hydrocarbons.

However, the sector, through its assessment of the changes on a world scale that have taken place during the last decade, of the prospects and challenges that were emerging in the long term, has, since the year 2000, perceived the need to deepen the reforms by the adaptation of the institutional, legal and organizational frameworks for all the branches of activity that come under its jurisdiction.

Thus, for hydrocarbons, the adoption of Law 05-07 of April 28, 2005, repealed and replaced by Law 19-13 of December 11, 2019, relating to hydrocarbons, enabled the State to resume its missions of public power, previously devolved to the national company Sonatrach. It entrusts to independent agencies, endowed with adequate means, the missions of promotion of the national domain of hydrocarbons, recovery of the oil and gas revenue and regulation of the market and the activities of natural State monopolies. The law also provides for clear provisions in terms of pricing policy on the internal market, allowing operators to cover all of their costs and adequate remuneration for their investments. These missions have been devolved to the Hydrocarbons Regulatory Agency, which is responsible for ensuring compliance with the regulations relating to the application of tariffs and the principle of free access for third parties to pipeline transport and storage infrastructures.

Furthermore, one of the key objectives of these laws is to initiate a reorganization of petroleum product distribution activities, with the ultimate aim of creating an efficient competitive market, while responding to the concern for the protection of health and the environment.

Concerning energy control, it is framed by law n° 99-09, of July 28, 1999. It defines the mechanisms for implementing the national energy control policy.

It has set up a National Fund for Energy Management (FNME) which accompanies the implementation of the National Energy Management Program (PNME) which it has also planned.

In 2020, as part of the government's action program, a new ministry in charge of energy transition and renewable energies was created, among its attributions we quote "Developing and promoting the control of energy and inter-energy", and "to promote the culture of the rational use of energy.»

2. Non-economic measures of the National Energy Policy

2.1. Regulatory and institutional instruments

2.1.1 The National Energy Council [Presidential Decree No. 81-92 of May 9, 1981]

To enable the achievement of the objectives set by the national charter, and with a view to taking charge of the needs of the national energy policy, a national energy council was created by presidential decree "Decree n°81-92 of 09 May 1981 creating the National Energy Council".

Missions of the National Energy Council:

The mission of the National Energy Council is to gather the data necessary for the definition of national energy policy, to coordinate its implementation and to control its execution.

In this context, the National Energy Council is responsible in particular for:

- To establish a long-term plan, intended to guarantee the energy future of the country,
- To adopt a program of actions intended to:
 - ✓ Valuing hydrocarbons, gas in particular,
 - ✓ Preserve the strategic reserves of the pars in terms of energy,
 - ✓ Improve the conservation and enrichment of the country's energy heritage,
 - ✓ Ensure priority satisfaction of internal consumption needs.
 - ✓ Define an internal energy consumption model allowing an economical use of resources,
 - ✓ Favor diversification of energy sources, through research, development and mastery of new sources.

To define the appropriate ways and means in order to:

- ✓ Promote the training of specialists and technicians,
- ✓ Guarantee the safety of energy and petrochemical facilities and infrastructure;
- ✓ Approve programs for the research and use of nuclear energy;
- ✓ Ensure the implementation of the energy policy in the short, medium and long term.

Presidential Decree No. 82-155 of April 24, 1982

A year after the creation of the National Energy Council, another decree appeared to modify and add some articles, namely:

The phrase energy policy has been replaced by "Liquid or gaseous hydrocarbons"

Article 6 and Article 6 bis have been modified and enriched to take care of administrative and procedural aspects

2.1.2 The New Energies Commission [Decree 82-46 of January 23, 1982]

Placed under the authority of the Council. Superior of Scientific and Technical Research, his mission is to implement the national policy in the field of new energies, in accordance with the orientations, decisions and priorities set by the Higher Council for Scientific and Technical Research.

It draws up and executes national plans for scientific, technological and industrial development related to its purpose. In this context, it is responsible for carrying out all

research, training, information, provision of goods and services and production necessary for the promotion and development of new energies, in particular nuclear, geothermal solar, wind and biomass.

2.1.3 Creation of the National Agency for the Promotion and Rationalization of Energy Use (APRUE),

The agency's mission, in liaison with the bodies concerned, is to ensure the implementation of the options resulting from the energy consumption model, in accordance with the guidelines, decisions and priorities set in this area.

In this context, the agency is responsible for designing, proposing, instigating and coordinating actions to contribute to the following objectives:

- ✓ Cover basic energy needs expand the areas of energy use,
- ✓ Promote the promotion of the most available forms of energy and their rational use,
- ✓ Encourage conservation and energy savings.

As such, the agency:

- ✓ Collects, uses and disseminates information specific to its field of activity, in particular that relating to demand, supply and the costs of making the different forms of energy available to consumers;
- ✓ Analyzes the consumption of different energy products, in the different sectors and uses and studies alternative consumption methods;
- ✓ Develops demand and supply forecasts for the various forms of energy and proposes action programs to ensure their balance in the short, medium and long terms;
- ✓ Studies and proposes regulatory measures relating to the use of energy;
- ✓ Studies and proposes subsidy schemes to contribute to the rational and efficient use of energy;
- ✓ Studies and proposes pricing systems for energy products favoring promotion, substitutions and energy savings;
- ✓ Studies and proposes all other measures of an economic, legislative, financial or technological nature that may contribute to the above objectives.

The agency also participates in the formulation and evaluation of investment programs in the production, transport and distribution of companies in the energy sector and ensures their consistency. It takes into account, in this assessment, programs for the introduction and development of new and renewable energies as well as programs for equipping hydraulic dams.

2.1.4 Law No. 99-09 of July 28, 1999 relating to energy management

The purpose of this law is to define the conditions, the means of supervision and the implementation of the national energy management policy.

It defined energy management as covering all the measures and actions implemented for the rational use of energy, the development of renewable energies and the reduction of the impact of the energy system. on the environment.

The rational use of energy

Covers the action of optimizing energy consumption at the different levels of energy production, energy transformation and final consumption in the industrial, transport, tertiary and domestic sectors,

The development of renewable energies,

Aims at the introduction and promotion of exploitable renewable energy transformation sectors, in particular solar energy, geothermal energy (biomass), hydraulic electricity and wind energy.

Reducing the impact of the energy system on the environment

Consists of reducing greenhouse gas emissions and exhaust gases in urban areas.

Objectives outlined by this law:

✓ Energy management aims to direct energy demand towards greater efficiency of the consumption system, through a national energy consumption model, within the framework of the national energy policy.

✓ The national energy consumption model, as a reference framework for the orientation and management of energy demand, is based on the following energy options:

✓ The priority and maximum use of natural gas, in particular for thermal end uses;

✓ The development of the use of liquefied petroleum gas (LPG), in complementarity with natural gas;

✓ The orientation of electricity towards its specific uses;

✓ The promotion of renewable energies;

✓ Gradual reduction of the share of petroleum products in the balance sheet of national energy consumption;

✓ Energy conservation, inter-energy substitution and energy savings in energy production, transformation and use.

Tools and Methods of concretizing the control of Energy retained in the law

The implementation of energy management is based in particular on the following obligations, conditions and necessary means:

✓ The introduction of energy efficiency standards and requirements;

✓ Energy efficiency control;

✓ Mandatory and periodic energy audit;

✓ The national energy management program;

✓ Research/development;

✓ The financing of energy management;

✓ Encouragement and incentive measures;

✓ Coordination of energy management actions;

✓ Improving knowledge of the energy system;

✓ User awareness.

The national program for energy management

The national program for energy management brings together all the projects, measures and actions in the following areas:

- ✓ Energy saving,
- ✓ The inter-energy economy,
- ✓ The promotion of renewable energies,
- ✓ The development of energy efficiency standards,
- ✓ The reduction of the energy impact on the environment,
- ✓ Raising awareness, education, information and training in energy efficiency,
- ✓ Research/development in energy efficiency.

Financing energy management

A national fund for energy management is set up to finance the national program for energy management. It is fed by:

- ❖ Graduated taxes on national energy consumption,
- ❖ The levels of taxes necessary to supply the fund, set by the finance law, are determined on the basis of the financing needs of the annual installment of the national program for energy management,
- ❖ State subsidies,
- ❖ The product of the fines provided for under the law,
- ❖ Taxes on energy-intensive appliances.

2.1.5 Law No. 04-09 of August 14, 2004 on the promotion of renewable energies in the context of sustainable development

The purpose of this law is to set the conditions for promoting renewable energies in the context of sustainable development. The promotion of renewable energies aims to:

- ✓ To protect the environment, by promoting the use of non-polluting energy sources,
- ✓ Contribute to the fight against global warming by limiting greenhouse gas emissions,
- ✓ To participate in sustainable development through the preservation and conservation of fossil fuels,
- ✓ To contribute to the national policy of regional planning by the valorization of the deposits of renewable energies, by generalizing their uses.

2.1.6 Creation of the High Council for Energy [Presidential Decree No. 22-112 of March 15, 2022 establishing the High Council for Energy].

A High Council for Energy was created, with the President of the Republic, on March 15, 2020 by Presidential Decree No. 22-112 of March 15, 2022 creating the High Council for Energy, this body is responsible for setting guidelines for national energy policy and monitoring it. It should be recalled that a similar body was created by presidential decree in 1981 called the National Energy Council.

Missions of the High Council for Energy

Chaired by the President of the Republic, the council is responsible for setting guidelines for national energy policy and ensuring its follow-up. As such, the council decides on the strategies to be followed in the following areas:

- The country's energy security through, in particular:
- The preservation, renewal and development of national hydrocarbon reserves;
- Monitoring and evaluation of the implementation of long-term plans for the development of infrastructure for the production, transport, supply, storage and distribution of energy products;
- The introduction and development of new and renewable energies, by guaranteeing the mining resources necessary for their development;
- The energy transition towards a new national model of energy production and consumption based on national energy and mining resources, external commitments and the country's long-term strategic objectives;
- Regulation of the national energy market;
- The impact of the national and international energy situation on the country;
- Valorization of energy resources;
- The energy dimension linked to the environment and climate change;
- Strategic alliances and international energy partnerships, including long-term and strategically significant trade commitments and agreements.

3. Economic measures of the National Energy Policy

In addition to the institutional and regulatory measures that have been in place since the 1980s, economic measures have come to establish this process of rationalization and energy control, among these measures, and more particularly in the transport sector, has been the introduction of LPG-fuel as an alternative fuel to Gasoline, this choice is explained by the ecological and economic advantages of this type of fuel compared to other fuels, To do this, a regulatory system governing the LPG-c activity has been implemented, the main texts of which are:

Conversion of vehicles to LPG-c:

- Interministerial decree of August 1, 1983 revised on November 23, 1985, relating to the conditions of equipment, monitoring and operation of LPG fuel installations fitted to motor vehicles.
- Interministerial decree of January 2, 1988 on the conditions for the approval of equipment installations allowing the use of liquefied petroleum gas (LPG) as fuel in motor vehicles.

GPL-c points of sale:

- Interministerial decree of September 20, 1983 on the conditions for the development and operation of installations for the distribution of liquefied petroleum gas as fuel.
-

Product quality:

- Order of March 11, 2006 amending the order of August 3, 2000 sets the composition of the LPG-c mixture.

Technical aspects:

- Executive Decree No. 90-245 of August 18, 1990 regulating pressure devices.

3.1 Tax measures:

From January 1, 2007 (finance law for the year 2007):

- Reduction of VAT for all LPG-c conversion equipment from 17% to 7%, this rate has been revised upwards (9%) from January 1, 2016 (finance law for the year 2017).

From January 1, 2011 (finance law for the year 2011):

- Abolition of the car tax payment for vehicles converted to LPG-c.

3.2 Fuel tariff measures:

The increases in fuel prices from 1 January 2016 led to considerable differences between the prices of gasoline and that of LPG-c.

With the maintenance of the price of LPG-c unchanged (9 DA/litre), the consumption of LPG-c increased from 290,000 tonnes in 2015 to 1,294,299 tonnes in 2021, i.e. a growth of 345.3% and a rate average annual growth of 28.3%

LPG-c, low-tax fuel (taxes represent 5% of the price at the pump)

Evolution of fuel prices at the pump on the national market

Table n°1: Evolution of fuel prices at the pump on the national market [2015-2020]

	Price at the Pump 2015 [DA/litre]	Price at the Pump 2016 [DA/litre]	Price at the Pump 2017 [DA/litre]	Price at the Pump 2018 [DA/litre]	Price at the Pump 2020 [DA/litre]
Normal Gasoline	21.20	28.45	32.69	38.95	43.71
Premium Gasoline	23.00	31.42	35.72	41.97	45.97
Unleaded petrol	22.60	31.02	35.33	41.62	45.62
diesel fuel	13.70	18.76	20.42	23.06	29.01
LPG	09.00	09.00	9.00	9.00	9.00
Gap Gasoline LPG	+13.6	+22.02	+26.33	+32.62	+36.62

Source: Hydrocarbons Regulatory Agency

3.3 Subsidies

Financing of LPG-c conversion kits

In order to encourage motorists to equip their vehicles with the LPG-c kit, the public authorities have reserved, through the National Fund for the Energy Efficiency of Renewable Energies and Cogeneration (FNEEERC), an envelope of up to 4.55 billion dinars to cover the 50% reduction in supply and installation costs for LPGc kits for 150,000 vehicles spread over 100,000 private vehicles and 50,000 taxis.

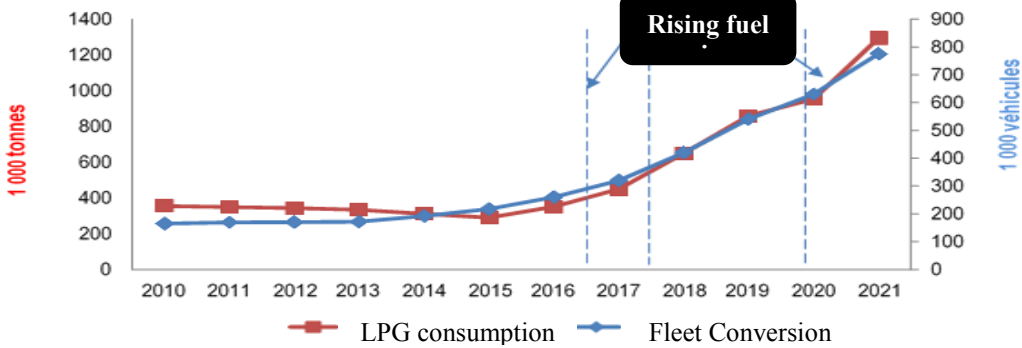
2.2.4 Other measures

Since 2012 (instruction from the Minister of Energy and Mines): To deliver fuel pump License the owner must equip the fuel station with LPG –c tanks licenses. Interministerial decree of 2 June 2014 setting the quotas for motor vehicles running on LPG/C to be included by car dealers in vehicle imports and the terms of its application: Imposing car dealers to include a minimum quota of 10% of vehicles equipped with GPL-c or CNG-c kit.

Signing of agreements between NAFTAL and the National Youth Employment Support Agency (ANSEJ) for the creation of micro-enterprises specializing in the conversion of vehicles to LPG-c. Under the terms of the framework agreement, NAFTAL has trained several dozen GPL-c installer technicians in ten (10) pilot wilayas.

3. Impact and repercussions of the measures of the national energy policy for the promotion of LPG-c

Figure n°1 Evolution of LPG fuelled motors consumption and the on-road fleet conversion to LPG (2010-2021)

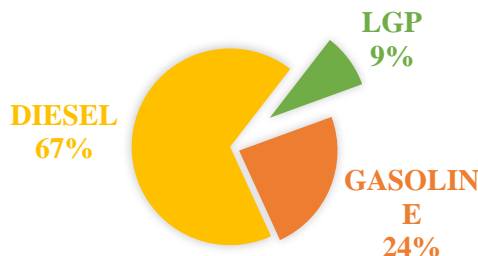


Source: Hydrocarbons Regulatory Agency

3.1 Impact on consumption

In 2021, the national consumption of LPG-c reached 1,294,299 tonnes , an increase of 36% compared to the year 2020. The share of LPG-c in the fuel mix is 9%.

Figure n° 2 National Fuel Mix 2021



Source: Consumption: Ministry of Energy and Mines data 2021

3.2 Impact on the number of vehicles converted to LPG-c

As of December 31, 2021: out of a fleet of "petrol" vehicles estimated at 4.37 million units, the number of vehicles with an LPG-c kit is 775,000, i.e. a conversion rate of the "petrol" fleet by 18%. The number of vehicles converted to LPG-c has increased from 165,000 in 2010 to 775,000 in 2021, this state of affairs is mainly justified by the incentive and promotional measures introduced by the public authorities and the very competitive price of LPG-fuel by compared to other products.

Table n°2 Evolution of LPG fuelled motors and Gasoline fuelled motors [2010-2021]

Year	Gasoline fuelled motors Millions	LPG fuelled motors Millions	Fuel to LPG fleet conversion rate
2010	2,185	165 000	7,6%
2011	2,352	169 500	7,2%
2012	2,522	170 500	6,8%
2013	2,636	171 400	6,5%
2014	2,935	192 400	6,6%
2015	2,952	217 100	7,4%
2016	3,101	260 100	8,4%
2017	3,193	320 100	10,0%
2018	4,074	420 000	10,0%
2019	4,202	540 000	13,0%
2020	4,318	630 200	15,0%
2021	4,376	775 000	18,0%

Source: - National Company of petroleum products distribution (NAFTAL)
 - Private installers of LPG conversion kit.

Conclusion:

Like several other countries, Algeria has opted for an energy policy centered on the control of energy, energy efficiency and the rationalization of the consumption of land fuels, to do this the energy substitution between fuels has been initiated through the LPG fuel for its economic and environmental benefits.

In this regard, several economic and non-economic measures have been developed and implemented in order to establish this approach, including tax and financial

incentives, competitive pricing and promotional campaigns, the aim of these measures was to develop the use of alternative energies in order to direct consumption towards cheaper energies, which proved to be effective as well as reduce energy import bills and open up potential export markets for refined petroleum products.

It appears from this study that the instruments and measures undertaken by the public authorities have been very effective in terms of substitutions between gasoline and LPG fuel and have caused the consumption of this product to explode over the last twenty (20) years, this has greatly contributed to the decline in gasoline consumption, and as a corollary has played a significant role in stopping imports and the country's self-sufficiency in fuels (gasoline).

Nevertheless, continuous efforts must be made to develop an equipment manufacturing industry necessary for the conversion of engines to LPG, the intensification and densification of the network of points of sale equipped with LPG tanks, a coordination between ministerial departments in order to implement a common policy and a roadmap to overcome the operational constraints encountered by investors in this niche.

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