

Gas as a cleaner alternative in cooking and transportation

By Suleiman Al-Herbish

Director-General, OPEC Fund for International Development (OFID)



Sustainable energy access is often discussed in a misguided context that implicitly or explicitly rejects a future role for any fossil fuels. However, natural gas and liquefied petroleum gas (LPG) are identified as important fuels with the potential to change energy development paradigms when given the chance. Advances in technology for extracting gas have resulted in an abundance of affordable energy that can be used to address access at a variety of scales. Natural gas and LPG are clean-burning fuels, with lower greenhouse gas emissions than traditional biomass. Indeed, the use of fossil fuels and the reduction of emissions are not mutually exclusive. Due to the cleaner nature of natural gas, switching the three billion people in the world currently cooking with traditional biomass to LPG would not only reduce global greenhouse gas emissions but would also have significant positive health outcomes.

Reducing Energy Poverty with Natural Gas

The UN commitment to achieving 17 global goals by 2030 includes “access to affordable, reliable, sustainable, and modern energy for all” as SDG 7. The eradication of energy poverty has a spillover effect for the achievement of other global goals; one in particular is SDG3 which is focused on ensuring good health and well-being. Household air pollution (HAP) harmfully impacts almost 41 per cent of the global population, predominantly poor, who continue to rely on solid fuels such as biomass, crop residues, and dung, for heating and cooking. Owing to poor combustion efficiency, these solid fuels release aerosol emissions and particulate matters. They are a major source of HAP. These emissions have a detrimental impact on health and environment. Particularly, poor women and children are at a high risk of exposure to biomass smoke and adverse health outcomes causing acute and chronic respiratory infection. Approximately 4.3 million annual premature deaths are attributed to HAP exposure. Nearly 50 per cent of deaths from acute lower respiratory infection among children below 5 years in underdeveloped countries are attributed to exposure to HAP. Continuous exposure to these emissions also leads to pregnancy complications and the stunted growth of children.

To address this challenge, a number of international development organisations, including OFID, have promoted improved cookstoves as a pathway to clean cooking. However, as the understanding of the health risks has grown, programmes have tended to broaden and to add the provision of other cleaner fuels like LPG. For example, the World LPG Association has

launched “Cooking for Life”, a long-term program to demonstrate the health benefits of switching communities from biomass and other traditional fuels to LPG for cooking. It also encourages decision-makers to recognise the need to ensure that LPG markets develop in a safe, managed way.

In addition, the Global LPG Partnership (GLPGP) is working to accelerate the transition to LPG for cooking for 50 million people by the end of this year. Via its grant program, OFID supported the GLPGP to promote the adoption and utilisation of LPG for clean cooking across the Economic Community of West African States (ECOWAS), through the creation of an enabling environment for impactful investment and intervention to scale up LPG use. OFID also extended a grant to the Global Alliance for Clean Cookstoves to conduct research and analysis on barriers to the accelerated use of liquefied petroleum gas (LPG) as part of a scaleable clean cooking strategy in three countries, Ghana, Kenya and Uganda.

Without a doubt, LPG is a common path to access clean cooking options, especially in urban areas. In 2015, an estimated 2.5 billion people, or 43 per cent of the population in developing countries, cooked with LPG. However, its use varies by region. For example, only 7 per cent of people in sub-Saharan Africa have access to LPG, mainly in Sudan, Nigeria, Angola and Ghana. Access to LPG is widespread in North Africa and parts of Latin America, and is increasingly being used in Asia. China and India are taking a strong stance on clean cooking through government-led policies. In China, residential biomass use has been declining 6 per cent per year since 2010, largely replaced by natural gas, LPG and electricity demand, especially in urban areas driven by policy efforts targeting clean cooking.

In India, though the number of people without clean cooking access has plateaued around 780 million since 2010, there are clear indications however that government policy efforts targeting LPG have begun to take hold. The Government’s Pradhan Mantri Ujjwala Yojana Programme is set to provide LPG connections to 50 million households living below the poverty line by 2019, with a target of 80 million households by 2020. By 2030, the promotion of LPG and improved biomass cookstoves by the government means that more than 300 million people will gain access to clean cooking facilities, but still more than one-in-three people will remain without. To support the efforts of the Indian Government, OFID provided a grant to scale up the adoption of “smart” gas meters and “pay-as-you-cook” business models that address the problem of LPG affordability. This project also receives the financial support from Saudi Aramco and the Shell Foundation, both are members of the “Oil



Global consumption of LPG as transport fuel has been rising rapidly in recent years

and Gas Industry Energy Access Platform (EAP)". The EAP is a collaboration among OFID, the WPC, TOTAL, Shell, ARAMCO, OMV, Schlumberger, IGU, GLPG, BCG and other strategic partners.

Therefore, in the transition to a new energy mix, fossil fuels will continue to have a major part and that provides the petroleum industry with an opportunity to play an integral role. This is due to the huge potential demand for energy which exists in the poorest countries. For example in developing countries, the additional LPG supply required to meet the cooking fuel demand in the IEA "Energy for All Case" will reach 0.7mb/d in 2030. This is equivalent to 30 per cent of the demand that is expected to be displaced by electrical vehicles by that year.

Natural Gas Fuelling the Transport Sector

The transport sector plays a very niche role for overall gas consumption. Only 1 per cent of global gas consumption is used for transport, with gas providing 2 per cent of overall energy used in the sector. Approximately 90 per cent of this consumption is for road transport in the form of CNG or LNG.

Despite low use globally, gas plays a prominent role for transport in some specific cities. In China, India and Pakistan, for example, gas consumption in transport is rapidly growing given public programmes to incentivise fuel switching as a means of improving air quality.

In India, the Government is promoting the use of CNG in

the country. According to Cedigaz, 11 per cent of total India gas consumption is in the transportation sector. CNG is now prevalent in around 11 (out of 29) Indian states, with many cities mandating its use in public transport (taxis, auto-rickshaws and buses). However, growth in this sector is severely constrained by infrastructure. India's Petroleum Planning & Analysis Cell reports that as of December 2017, there are 3.045 million natural gas vehicles (NGV) but only 1,282 CNG filling stations.

Meanwhile, in Europe and North America, many cities have supported the adoption of gas for heavy duty fleet vehicles like buses or garbage trucks. In Italy, for example, nearly 1,100 natural gas refuelling stations are currently used for 880,000 natural gas vehicles. However, as gas uses for urban transport increase, it requires the development of a new refuelling infrastructure.

LPG is also used as an alternative fuel for vehicles. Global consumption of LPG as a transport fuel has been rising rapidly in recent years, reaching 26.7 million tonnes in 2016 – an increase of 5.5 million tonnes (Mt), or 25 per cent, over the 2009 level. There are now more than 30 million vehicles in use around the world that use LPG, yet LPG as a transport fuel even for Heavy Duty Engine (HDE) and vehicles is still concentrated in a small number of countries. However, government initiatives in emerging economies such as China, Indonesia, and India to encourage LPG applications on HDE, could drive market growth over the coming years. ●