The 20th edition of the World Liquid Petroleum Gas Association’s Forum was held in Cape Town, South Africa in October. There could have hardly been a more appropriate city to host this annual event, reports Stephen Williams.

Bottled gas, otherwise known as Liquid Petroleum Gas (LPG), is increasingly being mentioned in the context of sustainable development. Without question, the link between energy and developmental aspirations is pivotal, and there is a clear argument that LPG has an increasingly important role to play by providing a safe, affordable, convenient, and cleaner fuel for the continent.

The gas itself, sometimes known as butane or propane, is mainly refined from conventional crude oil or natural gas, although it is also possible to use feedstocks such as coal.

The Paris-based World Liquid Petroleum Gas Association (WLPGA) is an international industry organisation with a membership approaching 180 companies which range from super-major energy corporations to small distributors and equipment manufacturers.

Year round, the WLPGA deals with such topics as fuel specification and equipment standards, consulting and engineering firms, regulations and safety rules, model taxation policies, new business contacts, new technologies, etc. It publishes studies and generally promotes the use of LPG.

This year, the WLPGA forum's focus was clearly on Africa. It linked up with the UNDP’s rural energy challenge initiative and devoted one of its three days to discussing how LPG can best help meet Africa’s growing energy needs. The forum attracted more than 500 delegates, including 170 from Africa.

It is widely believed that LPG has clear benefits over traditional biofuels in terms of impact on health. Jean Claude Gandur, president and CEO of Addax Petroleum has suggested that if the average African household switched to LPG, each family would save 120kg of firewood a year.

Furthermore, the WHO has estimated that if half of the number of people in the world currently cooking with solid fuels switch to LPG, it can provide health and productivity gains of more than $900bn over the next decade.

According to the figures for 2006,
around half of the world's LPG market is driven by the demand for household fuel, primarily for cooking purposes. However, in Africa, LPG demand for household applications is probably even higher.

In South Africa, the issue of promoting LPG has attracted ministerial support. Addressing the Cape Town forum, the minister of minerals and energy, Buyelwa Sonjica, drew attention to the fact that many South Africans spend up to a third of their salaries on energy, mostly for cooking and heating.

“There is a growing consensus that energy is central to reducing poverty and hunger, improving health and the lives of women and children generally” the minister said. “Sustainable development will only happen when energy poverty is tackled.”

**Power to the people**

The South African government has attempted to address the issue of energy poverty by providing poorer urban and peri-urban households, most of whom live in shacks lacking running water and sanitation, with a monthly basic electricity grant through Eskom, the electricity parastatal. Eskom supplies the country’s burgeoning informal townships with electricity.

When regular power “outages” began to hit the Western Cape province and the city of Cape Town itself earlier this year, Eskom came up with a radical initiative. It offered a starter kit consisting of an LPG bottle and a double cooking ring in exchange for customers’ electric stoves.

That helped to reduce the load on the electricity grid, while Eskom was able to build a local customer base for LPG in the townships, although there remains consumer resistance on the issue of affordability. Many perceive LPG as being more expensive than electricity and kerosene, the traditional alternative fuel.

There is also the question of availability. Both nuclear and coal-fired electricity generation and kerosene are far less thermally efficient as a cooking fuel, but they have the advantage of being easily available. Electricity, when the grid can provide it, can be switched on at the flick of a switch and kerosene is widely available in small quantities. But LPG is only retailed at larger shopping centres and petrol stations.

Yet, the advantage of LPG is that it is a far cleaner fuel, and safer too. Not only are emissions less hazardous to human health compared to kerosene or firewood, but the use of kerosene in mainly wooden shacks has obvious safety implications, and fires frequently rage through townships, invariably caused by the use of candles and kerosene stoves and lamps.

One of the major features of Africa’s LPG market is just how fractured it is. Speaking to the forum, Celia Onitiri, the president of the Nigeria National LPG Association, presented statistics drawing on research conducted with Mourad Belguedj, the energy sector advisor at the World Bank’s Oil, Gas and Mining Policy division. It showed a wide disparity in LPG use in West Africa.

For example, in Senegal, with a population of 10.2m, a total of 110,000t of LPG is used annually, while Nigeria, with a population of about 150 million, consumes just 58,000t of LPG.

The irony is that, just as most of Nigeria’s domestic petroleum is refined outside the country, so too is its LPG requirement. Much of the paltry 58,000t it uses is imported from neighbouring Benin despite Nigeria producing 4m tons of LPG a year – practically all of it exported.

Onitiri, taking advantage of the fact that Emmanuel O. Odusina, Nigeria’s new energy minister, was one of the Cape Town forums delegates, made an impassioned plea for her government to address both the lack of a suitable regulatory framework and enforcement that currently creates the major barriers to growth in LPG consumption in Nigeria.

She suggested that if an average family consumes 12.5kg of LPG a month, Nigeria, with a population of roughly 150m, is capable of consuming over 5.62m tons of LPG a year.

Other presentations also highlighted how different countries have very different LPG markets. In fact, most LPG-use in Africa is accounted for by the Maghreb countries. One of the underlying reasons is the issue of state subsidies.

In Algeria, for example, LPG is subsidised and its price is regulated. The country possesses one of the world’s largest gas reserves, and it is the world’s second largest LPG exporter after Saudi Arabia.

Last year, Algeria produced 8.8m tons and exported 6.9m tons with the balance of 1.9m tons left to meet the country’s own demand. Over 79% of this was used by residential and commercial consumers, 18% as motor fuel (a proportion expected to double by the end of this decade) and 3% for industrial use.

Similarly, in Egypt, Libya, Morocco and Tunisia, LPG is subsidised and its price regulated. These factors clearly have a bearing on North African LPG demand, accounting for 68% of Africa’s total.

When the Maghreb is excluded, LPG consumption per capita in Africa is barely more than 2kg/year, but it is evident that LPG has huge potential for making further gains in the rest of Africa.

The consequence would be a lowering of the continent’s harmful emissions - including greenhouse gas, which will improve the health of Africans, especially women and children; and helping to reverse the impact of deforestation currently being driven by the demand for charcoal and firewood.
The rise and rise of LPG

Just as Africa is being encouraged to switch from using charcoal and firewood, so should the developed world be encouraged to cut back on using charcoal – and Liquefield Petroleum Gas (LPG) has a number of benefits as a substitute fuel.

It is not just white South Africans that savour smoke-flavoured meats cooked on open fires; visit any black township and, usually in the proximity of the bus and taxi ranks, you’ll find a wide choice of roasted chicken, goat, beef, the famed boerewors sausage and even bushmeat for sale.

In the land that has turned the outdoor feasting on barbequed meat - the braai in South African parlance - into something of a national institution, it was interesting that the World LPG Forum in South Africa invited Myriam Maestroni of Primagaz, a French company, to make a presentation on the latest trends in the global market for barbeque fuels and equipment.

The most traditional fuel for open-air township kitchens in South Africa is firewood, and this is popular with most customers as it imparts a distinctive, smoky flavour to the meats. For the cook, the slow heat radiation of wood is ideal for roasting.

But there is increasingly awareness that, in some ways, wood is quite inconvenient. It may be relatively affordable, but supplies and its storage present problems and it takes a long time to heat up. Furthermore, wood produces a lot of smoke and its ashes cool down slowly.

In South Africa’s wealthier suburbs, just as in the West, charcoal is the preferred fuel. It is perceived as being more sophisticated than wood, but has many drawbacks.

Charcoal burns at a higher temperature and food cooked this way, for various reasons, can have health implications as commercial producers of charcoal ‘briquettes’ also use chemical additives such as borax, nitrate and lime.

While the use of wood for cooking in Africa is widespread, concerns over the environmental impact of deforestation means that alternative types of fuels, such as LPG, are increasingly being promoted by development agencies. Yet charcoal’s environmental impact is even more serious. Charcoal has worse CO2 emissions because its production requires a process based on the slow burning of wood for 14 - 16 hours at very high temperatures.

And markets in the developed world import charcoal from tropical forests which adds extra transportation emissions. In fact, Maestroni quoted figures that suggest that in the US alone, for Independence Day celebrations on the 4 July, nearly half of all American households burn charcoal barbeques. That has been estimated to consume, on a single day, 2,300 acres of forest, emitting 225,000t of CO2.

So, just as Africa is being encouraged to switch from using charcoal and firewood, so should the developed world be encouraged to cut back on using charcoal – and LPG has a number of benefits as a substitute fuel.

Unlike wood, it heats up quickly; it burns reasonably cleanly without any smoke; it is easy to use; and above all, if the equipment and LPG cylinders are maintained properly, it is very safe.

But can LPG provide that flavoursome, natural taste that meat cooked on open fire does? Yes, insists Maestroni, as new equipment designed for LPG comes to market. She described LPG barbeques that use a bed of stones or volcanic lava, heated from below, that can cook food to perfection.

There are also LPG barbeques that have plates where the gas flames are channelled and diffused to ensure a good spread of heat. By avoiding the direct flame the cook can avoid the carbonisation of foods which is responsible for creating heterocyclical amines, known to harm the pancreas. LPG also avoids the creation of toxic substances, such as benzo-pyrene, while better preserving fragile vitamins such as B6, B12 and E.

Essentially, Maestroni’s argument was that food cooked with modern LPG equipment is healthier than that cooked on wood or charcoal, as both the cooking temperature and cooking time can be more precisely monitored. That the fuel source is more environmentally friendly is a further reason why LPG cooking, both in Africa and worldwide, looks certain to grow in popularity.