

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

The Role of Gas in Sustainable Energy



UNECE

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UNITED NATIONS

GENEVA, 2015

Liquefied natural gas (LNG) – towards global gas markets

Recent market developments point to a fundamental change in the role of Liquefied Natural Gas (LNG) in the global energy landscape. The use of LNG to transport natural gas is poised to grow dramatically in the foreseeable future. Growing international concern over energy and environmental security has led to policies in both gas importing and exporting nations that will likely increase LNG trade in coming years. While significant growth of LNG trade has been anticipated for decades, developments in liquefaction, shipping, and gasification technology and costs, gas market supply and demand dynamics, economic accessibility of previously uneconomic resources, and geopolitics have created a new dynamic that is accelerating development of an LNG market that will progressively connect a global gas market.

Natural gas is a major energy source for power generation, residential heating and feedstock for industrial production. LNG offers a flexible means of transporting this energy source without the need for inter-regional pipeline infrastructure. While excess LNG import capacity and higher costs compared with pipeline transport have dampened enthusiasm for LNG in recent years, current trends point to increased reliance on LNG to supply the world's energy needs. Growing demand for gas, diversification of suppliers, new pricing mechanisms and the development of disruptive technologies have opened the potential for regionally isolated LNG trading to grow into a robust, more transparent global market.

The UNECE Group of Experts on Gas is working to develop Best Practice Guidance for Liquefied Natural Gas based on the key trends in global LNG trade. The primary goal of this effort is to provide a data-driven assessment of evolving trends in order to facilitate informed policy discussion at the national and

international level. This activity engages in a dialogue and analysis of the costs and cost trends through the whole gas and LNG value chains, and discussion of possible best practice guidance. The impact of LNG on security and diversification of supply, flexibility, liquidity, prices, and competition and market integration can be significant. There are opportunities for improvement in LNG specifications, liquefaction plants, receiving facilities, local operating procedures, LNG tankers designs, and so forth. Some harmonization of LNG quality specifications is needed to ensure it is acceptable at all LNG terminals and to a majority of end users. Players throughout the LNG chain, including regulators, will be encouraged to standardize and exchange information. Such efforts would improve compatibility and efficiencies and maintain safety levels throughout the industry. Attention should be paid as well to the development of small-scale LNG that is flexible, has lower capital costs, and can service smaller markets.

Building upon the findings and recommendations of the recently published UNECE study on LNG and taking into account recent data and trends, this task force will assess the potential for LNG in the UNECE region under an optimal policy framework. The work will be undertaken in collaboration with other relevant organizations such as the IGU, the IEA, and associations of system operators.

Removing barriers to using natural gas in transportation

Natural gas and bio-methane can be used to reduce pollution coming from transportation. Substituting natural gas for conventional fuels provides tangible environmental benefits: cars driven on natural gas emit significantly less carbon-dioxide (CO₂), sulphur (SO_x) and nitrogen oxides (NO_x) per kilometre

travelled than those using diesel or petrol. Emissions of CO₂ are reduced even more when renewable bio-methane is blended in (40% CO₂ savings with a 20% share of bio-methane). Natural gas vehicles also have reduced noise profiles, which is beneficial for vehicles operating in an urban environment.

Natural gas can be used as a fuel for any mode of transportation: on-road vehicles, scooters, heavy duty vehicles, ships, locomotives, even aircrafts. Natural gas vehicles (NGVs) are not zero-emission vehicles, but their environmental, economic and availability advantages make them an important alternative to vehicles running on conventional fuels. Further, deployment of NGVs will also support the infrastructure needed for the electric or hydrogen-fuelled vehicles of the future.

The UNECE Group of Experts on Gas is exploring how to remove barriers to the use of natural gas as a transportation fuel. Using natural gas as a transportation fuel is a critical area for natural gas demand growth, while reducing environmental impacts. The principal activity of the Group of Experts is development and dissemination of the specific recommendations on a range of topics from distribution to vehicles, including standards and technology as well as customer interaction. Limited infrastructure for fuelling NGV's is a significant barrier to deployment and the range of choice of NGV's is modest. Expanding both of these aspects would provide customers with an increased range of choice and ease of use. Understanding the details of the barriers will enable their removal and accelerate the use of natural gas in the transport sector

The use of NGV's varies widely across geographic regions, along with existing market and infrastructure. An exchange of good practices and lessons learned across the value chain is essential to support continued growth. Task force members

reach across the UNECE region and are playing an essential role and serving as a catalyst for ongoing investment.

Natural gas and renewable energy – allies or competitors?

In the future energy system natural gas and renewable energy will both play a determining role as each contributes to energy security, economic growth, enhanced energy access and quality of service and climate change. Despite this reality, the specific roles, values, and merits of natural gas and renewable energy in relation to the long-term energy transition are debated. The rapid deployment of renewable energy in some parts of the world coupled with the use of shale gas in the United States has contributed to significant departures from historical trends, prompting new dynamics in energy markets. The current nexus of these dynamics can be found in the power sector, but other trends likely will emerge in industry, buildings, cities, transport, agriculture, and end uses.

Mostly policy makers and industries have approached the issues facing natural gas and renewables separately or have concentrated on the competitive impacts of one on the other. UNECE's Groups of Expert on Gas and Renewable Energy founded a joint Task Force to address how more compelling business models could be developed so that these energy resources can be better aligned within a future energy system. The objective of the Task Force is to "Demonstrate the essential synergies between gas and renewables in achieving a sustainable future energy system by developing best practices and policy guidelines for gas to be an enabler of renewable energy and a part of a sustainable energy future".

Work has only just started and will focus at the outset on analysing how key countries approach the two energy sources in their respective national or regional energy policies, and subsequently will assess the economic and technical feasibility of alternative approaches including the benefits of properly structure regional balancing markets. The Task Force will conduct an analysis of the economics of gas-fired power in the context of green policies on renewables and gas, including an assessment of the impacts of support schemes on the gas sector and on both gas and power system management. Finally, best-practice guidelines will be prepared on the role of natural gas in a sustainable energy system.

United Nations Economic Commission for Europe

Sustainable Energy Division

UNECE's work on sustainable energy is designed to improve access to affordable and clean energy for all and help reduce greenhouse gas emissions and the carbon footprint of the energy sector in the region. It promotes international policy dialogue and cooperation among governments, energy industries and other stakeholders.

The Committee on Sustainable Energy and its six subsidiary bodies carry out concrete and results-oriented activities with the aim to achieve the specific objectives identified for each priority area:

Areas of work

- Cleaner Electricity Production
- Coal Mine Methane
- Energy Efficiency
- Natural Gas
- Renewable Energy
- Resource Classification
- Energy Security

For more information



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