RESEARCH OF EFFECTIVE AND EFFICIENT USE OF NATURAL GAS IN THE PRODUCTION PROCESS

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Abstract.

Gas saving in Uzbekistan is possible only through public policy. This huge potential, which has not been used to save money, improve environmental quality and reduce the foreign trade deficit, exists due to structural and market barriers that prevent the adoption of gas-saving practices and measures. Structural barriers include fuel price volatility, future uncertainty of fuel prices, limited access to capital, government tax and regulatory policies, codes and standards, and supply infrastructure constraints. This article discusses and theoretically analyzes ways to save this resource in the production process.

Key words.

Natural gas, Natural gas hydrate, Gas exchange, CO_2–CH_4, replacement, Thermodynamics, Energy efficiency, Process integration.

Introduction.

Energy resources in the sustainable development of any country consumption is the deciding factor. Because develop every type of product a certain amount of energy is used to produce, that is, each unit The cost of the product is also directly related to energy (heat, electricity energy). Saving and rational use of natural energy resources is a priority is one of the functions. Under the leadership of our President Consistent reforms in our country from the first years of independence being carried out. President Islam Karimov's “World Financial and Economic Crisis, Ways and measures to eliminate it in the conditions of Uzbekistan "also reduce energy consumption in technological processes, energy the introduction of cost-effective technologies is ongoing, especially in rural areas important tasks such as creating an energy supply. Saving and more efficient use of natural energy resources, recycling the importance of renewable alternative energy sources is enormous.Solar energy from renewable energy sources in the country and the use of biomass energy is highly efficient. On March 1, 2013, the President of the Republic of Uzbekistan signed a decree “On alternative energy sources Decree on Measures for Further Development, International Sun. The establishment of the Energy Institute will take reforms in this area to a new level is a solid foundation in the extraction. So far, they have local and world experiencetaking into account the legal, scientific and technical, further perfects the practical foundation. Renewable energy Further development of the scientific potential of Uzbekistan in the field of advanced and based on cost - effective technologies plays a significant role in its widespread use.

Main part.

Breaking the bounds of classical natural gas hydrate (NGH) production processes, a newborn concept based on the gas exchange mechanism provides an opportunity to catch two birds with one stone: simultaneously achieving the sequestration of CO2 for climate change mitigation and the

enhanced recovery of CH_4 for energy production. As a 'new paradigm' in NGH production schemes, the non-destructive gas exchange as one of the most stable and promising NGH recovery approaches has received much attention in the fields of physics, chemistry, chemical engineering, civil engineering, petroleum engineering and geology. In this review, we assess the state-of-the-art gas exchange concept for NGH production by understanding its principles and developments, with emphasis on another technical breakthrough using the CO_2 + N_2 gas mixture injection. After establishing the fundamentals of the gas exchange process, we make a general survey of the NGH field production in the North Slope of Alaska in 2012, which practically adopted the gas exchange as a key technology. Several recent international NGH field production tests that basically use depressurization are also briefly analyzed for comparison. We suggest that the gas exchange method is ready to be tested in the NGH deposits with the valuable lessons learned from past pioneering tests.

The consumption of natural resources has been increasing continuously during recent decades, due to the growing demand caused by both the economic and the demographic rise of global population. Environmental overloads that endanger the survival of our civilization and the sustainability of current life support systems are caused by the increased consumption of natural resources—particularly water and energy—which are essential for life and for the socio-economic development of societies. While not yet well utilized, process integration and polygeneration are promising tools which reach the double objective of increasing the efficiency of natural resources, and also minimizing the environmental impact. This paper discusses the concepts of polygeneration and energy integration and various examples of polygeneration systems: (i) sugar and energy production in a sugarcane factory; (ii) district heating and cooling with natural gas cogeneration engines and (iii) combined production of water and energy. It is clearly evident that polygeneration systems which include appropriate process integration significantly increase the efficient use of natural resources.

Natural gas is found in abundance in many regions of the world, in quantities that ensure energy sufficiency for human activities for 250 years or so, based on current estimates. In the global energy industry's turnover in 2011 natural gas participated in a proportion of about 21% ranking just after oil and coal, as the third largest energy source [1]. In financial figures, that translates to hundreds of billions of U.S. dollars per year [2]. This paper will analyze the elements of that fuel demonstrate its importance as a source of energy and assess the perspective of its contribution to meeting energy needs in the future. The methodology includes the description of natural gas, its origin, probable stocks and their geographical distribution, the procedures of extraction, its use, comparison with other energy sources, prospects of exploitation of new deposits and modes of transport from point production to the place of consumption.

The production of heat and light by burning natural gas was observed thousands of years ago, when random events such as forest fires and thunderstorms caused ignition of gas emissions from the soil and the appearance of a continuous flame. The lack of knowledge and the inability to explain the phenomenon created myths and prejudices. One of the most famous "flame" of this type was discovered in ancient Greece, on Mount Parnassus around 1000 BC. The accidental discovery by a goatherd of what looked like a "flaming fountain" sprang from the hole of a rock, was characterized of divine origin and led to the founding of one of the most important places of worship of antiquity, the Oracle of Delphi [5]. About five centuries later the Chinese discovered the possibility of using the outgoing ground gas to their advantage. They built makeshift bamboo pipes and carried gas in the combustion area, not far from the source, to boil seawater for production of salt and drinking water. During the 19th century natural gas was mainly used for illumination of roads and public buildings. In 1885, the American inventor Robert Bunsen created a device that was mixing gas and air in proper proportions to safely burn them, for use in cooking and heating [5].

Conclusion.

Natural gas is found in abundance in many regions of the world, in quantities that ensure energy sufficiency for human activities, based on current estimations, for about 250 years. Exploitation of localized deposits of natural gas from unconventional sources and the search of new, is an economic vision and a technological challenge, but raises serious environmental concerns and new geopolitical balances. The combustion of natural gas is the cleanest compared with other fossil fuels, especially in CO_2 emissions, but even these small emissions do not cease to contribute to creating the greenhouse effect. The number of various uses of natural gas, the relatively low cost of its production and the continued expansion of pipeline networks and transportation of liquefied natural gas, coupled with estimates for increasing global energy needs are a cycle of self-reinforced actions that make gas an attractive energy source. Natural gas is an important determinant of energy policy not only of many countries, especially the producers, but also of international organizations. The advancement of technology in the energy sector may be able to bring revolution in the near future, by producing abundant, clean and economic power, which would marginalize the previously known sources. This will obviously cause conflict of powerful lobbies some of which favor the introduction of novelties and others to retain the status quo.

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