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# The role of natural gas in a hydricity model

**Introduction to EF6.A: PGCA**

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# Slide 1 Subject Topic

Subject Topic may be as:

- To design a hydricity model in which the role of natural gas as a transition fuel  will be analyzed.

# Slide 2 Objectives

Objectives may be formulated as:

- To analyze critically the reliability and applicability of hydricity model;
- To re-analyze the sustainable development based on natural gas as the most clean energy source.

# Slide 3 Examples of Report Topics

Examples of Report Topics might include:

- Re-consideration of moving forces to low-carbon future based on no-data confirmation (lack of confirmation) of global warming theory;
- Re-consideration of moving forces for sustainable development;
- Will even graduate shifting to hydricity model be realistic?
- Re-estimation of sustainable development based on gas production as the best energy supplier.

# Slide 4 Keywords

Keywords include:

- hydricity model: possible future;
- sustainability of gas industry;
- key drivers of sustainable development;
- gas as the cleanest organic fuel.

# Slide 5 Hydricity

1. Hydricity is based on using hydrogen for energy accumulation, transmission and consumption. The development of this industry will allow to use hydrogen for production and transmission infrastructure. Hydrogen is very wide-spread on the Earth surface. Its combustion heat is very high. The combustion product in oxygen is water.
   The challenge lies only in producing hydrogen fuel from water.
   The US Department of Energy (DoE) calculated that hydrogen and gasoline costs will equal by 2015. These calculations are based on price dynamics of the last decade and assume further growing of oil prices.

# Slide 6 Hydricity

- Hydricity is a very promising industry. Japan is the good example. Southern Korea adopted the plan of increasing its share in economy, even developing “hydrogen economy”. By 2050 it is planned to generate 22% of total energy and 23% of consumed by private sector energy from hydrogen fuel cells.
  The USA also has great plans for hydricity. The USA is going to develop “hydricity” by 2025. Iceland expects to largely transit to hydrogen economy by 2050. However, main application of hydrogen is related to ammonia and gasoline production. Every year the USA generates approximately 11 mln t of hydrogen. It is annual consumption of 35–40 mln automobiles. The EU and USA have special hydrogen pipelines; in Europe their length amounts to 1500 km, in the USA – 750 km. Regular gas pipelines can also be used for hydrogen transmission after certain upgrading. The challenge lies only in economic feasibility.

# Slide 7 Hydricity

- It is not expected that great plans of “hydrogen economy” will be implemented soon. Ambitious plans of governments do not imply replacement of old power industry since it is a conventional basis of hydricity. It can be developed only together with old power industry, its pace depends on oil dynamics on the global market. Drop of “black gold” prices caused by economic crisis can significantly slow down the growth of the unconventional energy on the whole and hydrogen energy in particular. While hydrogen fuel production depends on old power industry, its prospects are illusive even in automobile sector. In aviation and railway transport as in automobile transport hydrogen does not lead to a revolution in engine efficiency and principles. Like biofuel it plays a conservative role of oil fuel analogue.

# Slide 8 Sustainable development

Moreover, the report comprises other topics, including the following:

2. Assessment of sustainable development of the gas industry should not be based only on environmental issues related to greenhouse gas emission reduction. Sustainable development of gas industry should be based on “producer-transit country-customer” cooperation.
3. One should mention the role of the Russian Federation and JSC Gazprom as one of the major gas suppliers.
4. It is necessary to strengthen the role of LNG, CNG, HNG and GTL. Development of these areas for the whole gas industry and JSC Gazprom in particularly is especially important since they are considered priority for diversification of gas supplies to global markets. At the same time, it corresponds to the similar ways of gas market development as it was for oil one during some decades ago. Natural gas will be the most important and sustainable global energy source.

# Slide 9 Sustainable development

5. One should discuss various risks, such as geopolitical, transit, geoeconomic, having a direct or indirect impact on natural gas supplies to different markets and considers the influence of crisis and counter-crisis effects on the global gas industry. The mutual responsibility of Parties for the transit operations should be especially stressed.

6. The hydricity model based on hydrogen production from methane with its further combustion in the reaction with oxygen requires the review of the whole life cycle, including the hydrogen generation process, which will cause significant reassessment of the hidricity model. The possible implementation of this model should be lasted for end of 21th-beginning 22th centuries with parallel development of solar and thermonuclear energy sources.

7. It is possible to use alternative energy sources (solar, wind power energy, biofuel) for power industry and the natural gas seems the most important energy source for supporting these sources for achieving their economical and environmental stability.

# Slide 10 Conclusions

To conclude,

- Hydricity is a very promising industry, the challenge lies only in economic feasibility;
- As regards the sustainable development of gas industry, it will be based on sustainable development of gas production – gas transport and gas consumption;
- It should be once again stated that due to the lack of reliable proof of global warming processes and, correspondingly, the lack of connection between the growth of the concentration of various natural components in the atmosphere and global temperature change sustainable development of the gas industry should be based on gas as the most energy effective and environmentally friendly fuel for future development of global power industry.