### Role of Natural Gas in a Sustainable Energy Future

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Thank you for that introduction.

It is an honor to be part of a panel with such distinguished energy leaders and experts. When I look around the room, I see many familiar faces, good friends and long-standing business partners. Many of us have been working in the energy sector for decades, and together we have shaped the face of the global energy market as we know it today.

The question before us now is, "what is the role of natural gas in a sustainable energy future?"

The aim of my presentation today is to show how the wider application of natural gas can facilitate progress towards a sustainable energy future, which also meets other key energy policies: cost competitiveness and energy security.

The role of natural gas in ensuring a sustainable energy future cannot be underestimated and we cannot let politicians or special interest groups cloud what is an obvious solution for carbon management, economic growth and supply security. Natural gas is not only the green fuel of today, but the future as well. For this reason, it should be at the center of strategies for carbon reduction. For a long time we have been fighting against natural gas being lumped in as "just another" traditional fossil fuel allegedly hindering rather than helping the fight against global warming.





## Natural gas deserves to be centerpiece of GHG reduction strategies

#### Limited progress in combating climate change:

\* Progress in achieving the 20/20/20 EU targets slowed down despite EU Emissions Trading System



and generous subsidies for renewables

The EU goal of cutting CO2 emissions is being mistakenly replaced by the decarbonization drive

To begin with, let us take a look at the major target for sustainable development set up by the EU which would like to lead the combat against climate changing. This target requires a cut of 850 million tons of CO2 equivalent by 2020 from the 1990 reference point. Some progress towards reaching the target has been made – reduction by 465 Mt CO2 was largely due to economic restructuring in Central and Eastern Europe in the early and mid 1990s and partial switching to gas fuel in certain other countries. But from 2000 the progress floundered and recent developments does not instill confidence that the target will be met. Such limited progress has taken place in spite of the thrust of current policies including the introduction of the EU Emissions Trading System and subsidization of a large amount of new renewable power generation capacity. However, the EU would like to target even more ambitious goals.

Within the 20/20/20 program, the EU sets the target, among others, to reduce bad gas emissions by 20% until 2020. But in the fact, this goal is being replaced by the decarbonization of the European energy industry, which is by far not the

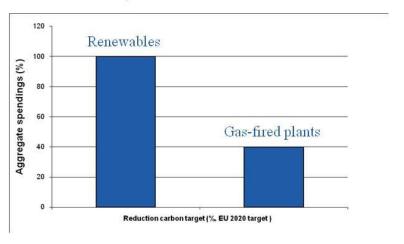
same as emissions' reduction. I'd like to draw your attention to that particular discrepancy.





## Natural gas & renewables: cost comparison:

- \* The renewables will only allow the EU countries to achieve 62% of the 2020 target reductions;
- \* To achieve 62% reduction by 2020 all-in natural gas costs will be only 40% of the renewables cost.



We all understand that natural gas gives an excellent opportunity to combat emissions. Despite that, gas scenarios are not taken into consideration in the EU. All the fossil fuels are treated in the same way. There are ideas to introduce carbon taxes in order to decarbonize the economy. At the same time renewables are subsidized. We made an estimate for 12 EU countries and found that the spread of renewables will cost over 1.5 trillion euro over the next 20 years, with more than half of that amount coming directly from government subsidies. This is being done in a fiscal environment where many EU countries are mired in debt and major cuts in government spending have been announced. Many EU countries have debts that are among the highest in the world. According to the UK government estimates, the combined deficit among EU's 27 member states will reach 868 billion euro this year.

Will the subsidizing policy which is distorting the interfuel competition bring along the expected achievements in lowering emissions? The answer is No. Even with the massive spending and subsidizing planned for renewable energy, the addition of renewables will only allow the EU countries to achieve 62% of their carbon reduction targets. The same amount of natural gas fired capacity would provide as much as 41% of the reduction target, but at a minute fraction of the renewables' cost. In fact, to achieve the same 62% reduction by 2020 all-in natural gas costs would be only 40% of the cost of renewable energy. To fully meet the EU targets by 2020, the cost of incremental natural gas generation would be 800 billion euros less than meeting the same targets with renewables.

Natural gas is neither coal nor oil. It is much more environmentally friendly and produces much less carbon per each unit of energy than any other fossil fuel. Burning gas instead of oil reduces CO2 emissions by 20% - and by 50-60% if used as a replacement for coal. Take another example: increasing the share of gas in the EU energy mix by only 1% will reduces emissions by 3%. This makes natural gas the best near- and long-term solution to meet the inter-linked goals of combating climate change and reliably powering economic growth and spreading prosperity.





# Comparison Of Costs Of Meeting EU CO2 Reduction Targets:

- \* gas powered generation is cheaper than on-shore wind generation by \$11.3 billion p.a. (in order to reach the set target)
- \* If Europe replaces every second coal power plant with gas turbine plant,

with gas turbine pla CO2 emissions would be reduced by up to 60%

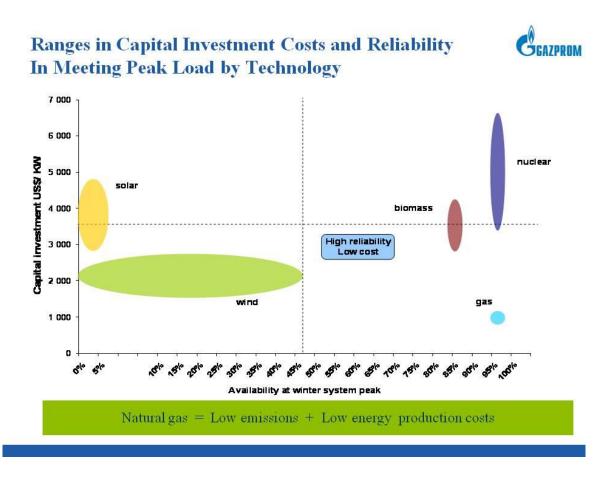


\* Renewables and nuclear energy are only part of the solution. Best option – find the right place for every source in energy mix

Let us compare costs, including fuel and operating costs per year. Renewables, as you know, have no fuel costs. Nevertheless, the net result is the same – gas is the cheapest technology to reduce the CO2 emissions currently produced by coal-fired generation. In order to reach all the CO2 reduction targets, if European customers choose gas powered generation, their expenses will be US \$11.3 billion p.a. less, if compared with costs of achieving the same results through on-shore wind generation. This is valid at any price of gas, up to \$8.4 per MMBTU (double as much as it costs now on Henry Hub in the USA). Given additional expenditures for wind-based power transmission grids, gas-based solutions are more efficient on a full cost account.

Gas already provides a fast, reliable and comparatively inexpensive way of reaching ecological targets, particularly when compared to the significant investments that a switch to renewable energy sources would imply. We have calculated that if Europe were to replace every 2<sup>nd</sup> coal power plant with a gas turbine plant, CO2 emissions could be reduced by up to 60% and 2020 emission goals would be met. There is, of course, a role for renewable energy to play as we

move towards a low-carbon world, and we are also likely to see a new age of nuclear power. But both renewable and nuclear energy are only part of the solution. They cannot fix the problems on their own. The problem is to find the right place for every energy source in the energy mix, to make the system be efficient, economically viable and ecologically friendly. Obviously, natural gas is part of the rational solution, it should be widely used, not be targeted as enemy of green economy.



There are questions about the reliability of wind and solar power since we cannot control when the wind blows and the sun shines, or whether it can shine or blow steady enough to cover peak demand. As such, no system operator can offer guarantees that it is possible to meet the demand at peak time using renewables. Not to mention that some technologies, although promising, are a long way from development on even a fraction of the scale needed. From the point of view of energy security, natural gas is the safest source of energy when it comes to peak consumption, compared to other sources of energy, including nuclear, solar, wind energy and hydropower industry.

Also, these estimates do not examine the contribution of power generation technologies to supply security. Here, gas comes out on top in terms of meeting peak demand in a predictable manner – "keeping the lights on." In short, there is no comparison between reliability in peak hour supply of power generation from renewables such as wind, wave, or solar, and from gas-fired generation. For example, in the UK, the load factor for wind generation at the peak system load in winter over the last six years has ranged from zero to fifty percent. But in two of those years the load factor for wind generation was in the range of zero to ten percent. In effect, wind cannot be relied on by planners or grid operators to meet system peak. Similar figures have been observed in Germany, Europe's largest wind energy producer.

Renewables also depend to a very large extent on market-distorting public subsidies. For example, to achieve the same effect of CO2 reduction by wind power, investments of some \$150 billion will be required. For the construction of gas-fired power-generating facilities of the combined cycle one would need \$50 billion, which means you can save \$100 billion by investing in gas. When it comes to nuclear power, it is still more expensive and comes with its own environmental and security concerns. Even after 60 years of research nobody knows how we could safely store our nuclear waste for the next 6000 generations. As such, everybody knows that constructing nuclear power stations may well be a project for decades, not years.

In contrast, natural gas has proven reserves, it is competitive in price and has a modern infrastructure already in place. What is more, new gas-fired power stations can be built quickly, and they are highly reliable and provide good value for money.

Natural gas is a very flexible fuel, and gas-fired power plants are very well suited to complement the decentralized and volatile power production of the emerging renewable energy sources. One may ask what to do with the many yet to be constructed gas-fired power plants when Europe will move to a carbon free economy after 2050. In fact, many more gas fired plants will be needed. For every 4 megawatts of wind capacity installed there is the need for at least 1 megawatt of back-up fossil-fired generation needed to satisfy peak demand. Until we find a solution for increasing the reliability of renewable technologies, gas will be their natural partner.

It would be a wise response to the challenge if we suggest a flexible approach to carbon management with natural gas being part of the solution. Without a greater reliance on natural gas, there is little prospect of meeting carbon reduction goals. But reaching those goals also requires a change of mindset in high offices.





#### LNG is motor fuel of choice

LNG truck may reduce nitrogen oxide (NOx) and greenhouse gas emissions by up to 33 percent and 20 percent respectively



### LNG motor fuel could be game changer:

- \* additional revenues for pump stations
- \* extending product line: compressed gas, biogas, etc.

There is also one very promising application for natural gas in the future sustainable economic development: using it as a motor fuel of choice, primarily in the LNG form for heavy duty trucks. Heavy duty kind of vehicles is the most polluting and fuel consuming, so their switch from diesel to ecologically friendly gas is extremely promising and would contribute both to a substantial reduction of emissions as well as to cost saving.

A typical LNG truck may reduce nitrogen oxide (NOx) and greenhouse gas emissions by up to 33 percent and 20 percent, respectively, compared to a diesel-

fueled truck. In the USA and Canada, for instance, the cleaner burning LNG fuel typically costs about \$1 per gallon less than the diesel equivalent fuel (see picture).

Use of LNG as motor fuel could be a real game changer for the world gas market. Big quantities of LNG needed for heavy duties could drive up the revenues of gas sections of pumps and serve as locomotive for all the product line of motor gas – compressed gas, biogas, etc.

Ladies and gentlemen, the natural gas industry has a compelling story to tell policy-makers and the general public. It can make an enormous contribution towards achieving carbon reduction goals with a level of certainty that no other fuel or technology can promise and at an all-in cost that cannot be matched.

I believe that without powerful and effective advocacy on the part of the gas industry, governments will not reach optimal and financially viable solutions to crucial problems by themselves. That is why Gazprom intends to be a leading architect in the energy strategy for a clean future, as a generator of ideas, market major, technology leader and international energy supply partner.

The long-term future for natural gas is bright. Gazprom will continue to make the investments needed to help meet the needs of consumers, industry and economies for clean, affordable and reliable supplies of energy for many decades to come.