Maintaining the value of gas reserves in a carbon neutral world
(Сохранение стоимости запасов газа в углеродно-нейтральном мире)

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EU: Changing upside-down vision of the future role of gas => new potential niche for Russia-EU cooperation in energy since 2017/2018

Absolute optimism for gas => gas as target (destination) fuel!

Fossil phobic attitude to gas => EU: Gas as transition (bridge) fuel => “Live & let die!”

Gas to be redefined => greening of gas => “Gas” as target (destination) fuel?

Oil price peak; afterwards (2010-2014) high oil prices & contractual gas price, but slowdown gas demand, gas oversupply (physical &/or contractual) & low spot prices

EU “20-20-20” policy

IEA “Golden age of gas” Report

Paris Climate Agreement (COP-21)

EU: RES only as the means to reach decarbonisation targets: digital, electrical, renewable EU energy future

EU rethinking the means to reach its decarbonisation targets to RES + decarbonised gas: new role for new “gas” (f.i. SG3 IGU Strategy Committee)

Konoplyanik, ENERGETIKA, SPB, 14-16.11.2018
Political economy of world energy: production factors, inter-factors competition & STP in energy – & current competitive niche of Russia

Zones of competitive advantages of different states:
- labour: developing (price), developed (quality)
- capital (financial markets + innovations, technologies): developed (anglo-sax),
- energy resources (non-renewable/hydrocarbon): OPEC/KSA, USA, Russia => current (beyond defense industries) zone of competitive advantages of Russia = mostly in non-technological areas (?) => Russia’s dilemma: to switch from energy resource sphere or to stay within it but on the new competitive basis ?
=> how to monetize existing Russian energy – natural & technical - assets: natural (energy) resources & production infrastructure/facilities

Options for increasing energy efficiency (diminishing energy cost component in GDP) = substitution:
1. By other energies => inter-/intra-fuel competition (STP)
2. (Direct) labour => export energy intensive industries to (developing) countries (cheap labour + lower ecological concerns)
3. Capital (past labour) => increase energy efficiency through all energy value chain (STP)
4. Non-energy materials (in non-energy use of energy resources) => (STP)
MCSS position relative to Sun determines 178 year-long climate cycle

Earth fluctuates not around Solar but around MCSS. Incoming flow of solar radiation depends on Sun-Earth, not on MCSS-Earth distance. If these distances differ by Solar diameter, then flow of solar energy fluctuations long-term (±24 W/sq.m) exceeds by 10 times increment of this flow (2.4 W/sq.m), which IPCC called as result of anthropogenic GHG increase.

MCSS = Mass Center of Solar System
IPCC = Intergovernmental Panel on Climate Change

RAS official position: “Kyoto Protocol has no scientific justification” (RAS President Yu.Osipov to RF President V.Putin, 17.05.2004)

Two global challenges and possible similarity in reaction to them

Past challenge (2nd half XX century):
Energy intensity of economy

- Oil switching (OPEC to non-OPEC oil) => structural effect
- Fuel switching (oil to nonoil energies => fossil & non-fossil fuels/RES) => structural effect
- Energy switching (1): energy to labour (substitution expensive energy by cheap labour => geographical transfer of energy intensive industries) => structural effect
- Energy switching (2): energy to capital (energy efficiency => technological (rev.STP) effect
- New infrastructure to be developed from the start of switching

Current/future challenge (1st half XXI century):
Carbon intensity of economy

- Fuel switching (1) => other fossil fuels to gas (coal to gas in power & heat generation; oil to gas in motor fuels) => structural effect
- Fuel switching (2) => gas to MHM (as fuel at existing gas infrastructure & appliances) => structural & technological (Rev.STP) effect
- Fuel switching (3) => gas & MHM to hydrogen => technological (Rev.STP) effect:
  - From gas (+ monetizing natural gas resources)
  - From non-gas sources (RES electricity)
- Existing gas infrastructure can be used and later adapted

- Each measure (next step) additive to previous ones => accumulative effects;
- Sequence of measures: from easy-going & cheap to more costly & longer-term effects
How high in the list of national priorities climate agenda (and thus decarbonization) is placed due to objective preconditions

**EU**

- Accumulated negative ecological consequences since 1st industrial revolution (started much earlier => longer accumulation period)
- Smaller territory, higher population density => higher unit negative accumulated ecological effect
- Lack of forests (result of early industrialization) => lower environmental recovery capacity (ability) => GHG emission exceeds its natural absorption (by 4 times?) => EU is **GHG net-emitter** (like US, China, India...)

**Russia**

- Industrialization started much later
- Large territory, lower density of population – much lower unit negative ecological effect
- Large territories covered with forests => highest environmental recovery capacity (ability) => GHG natural absorption exceeds its emission (by few times?) => Russia is **GHG net-absorbent** (plus other 4-5: Canada, Brazil, Australia, New Zealand and (?) Sweden)
- Too early switch to posterior technological steps in decarbonization chain of actions in Russia might be counter-productive => historical lessons:
  - from 1980-ies: Caspian Sea level vs water transfer from Siberian Rivers proposal;
  - from 1960-ies: Verkhneobskaya (Higher-Ob) hydro power station proposal

To find the balanced economically justified & mutually acceptable joint solutions

Export-oriented decarbonization?
Decarbonisation in Russia & in EU are two different stories, BUT common denominator (though within different priorities): available cross-border Russia-EU capital-intensive immobile gas infrastructure NOT to be converted into stranded asset in case gas is NOT considered as just “transition (bridge)” fuel => material background for Russia-EU cooperation in decarbonisation
Conceptual (technology-neutral/non-discriminative) approach: joint evaluation of potential implementation effects of different gas decarbonisation technologies at different segments of the Russia-EU cross-border gas value chain as the means to find the balanced (mutually beneficial) solution.

Scale of potential effects of different gas decarbonisation technologies

Downstream | Russia-EU cross-border gas value chain | Upstream

NB: figures = technologies; effect (an option) = “cost-plus” price (at end-user) of 1 kg of Hydrogen (center of circle); size of circles = measurable effect (both sides to jointly decide: what to measure & how to calculate; an option = market for hydrogen in specific sectors compared to alternatives); size of circles purely illustrative.
Joint debates lead to additional possible options => 14.11.2018

- Solution for country with gas resources might be different from countries without gas resources (M.James), as well as for countries with gas resources but in different geographical locations (different distances from the EU market for Russia & Norway)
- Trilateral search for best decarbonisation option (?)
  - Available CO2 storage capacities in Norway might stimulate increased gas export from Russia to EU for decarbonisation downstream EU both without & with CO2 => CCS for H2 + CO2 for EOR in Norway ?
“Time is the essence - & cooperation” (R.Dickel)

• ...but fast gas system transformation from CH4 to H2 without adequate assessment of all reasonably possible decarbonisation alternatives create the risk of inadequate investment decisions which are “the highest threat to international energy security” (B.Nitzov/ECS for G-8/2006/SPB)
  – “to develop a totally new grid system of a scale that never existed before in a very short period of time” (J.Ball)

• Cooperation Russia-EU:
  – …is between sovereign states => national priorities does matter,
  – …does not mean export of one party’s approach to decarbonisation, but joint assessment of different alternatives among broad range of available options,
  – Integrated joint study – technologically neutral approach
Thank you for your attention!

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