Evolution of EU low-carbon policy/vision – and prospects of Russia-EU cooperation within GAC WS2: challenges & bifurcations (introductory remarks of the WS2 co-chair)

Prof. Dr. Andrey A. Konoplyanik,
Co-chair Work Stream 2 “Internal Markets”, Russia-EU Gas Advisory Council;
Adviser to Director General, "Gazprom export" LLC;
Professor on International Oil & Gas Business,
Russian State Gubkin Oil and Gas University

28th GAC WS2 meeting, Brussels, ENTSOG, 29.03.2019
Evolution of EU low-carbon policy/vision – and prospects of Russia-EU cooperation within GAC WS2: challenges & bifurcations

Yesterday in EU (yesterday & today beyond EU)

First EU energy vision (up to end-2017)

EU (1) Energy Future = “digital, electrical, renewable” => RES-based => evolution of the thesis since then

Second EU energy vision (since early 2018)

EU (2) Energy Future = “digital, electrical, renewable + gaseous” => RES + decarbonized gases => what’s that?

Current state of debate (EU/GAC WS2) – to identity challenges & bifurcations (Third EU energy vision ?)

...in competition with imported LNG to EU:
(i) EU Quo Vadis => barriers for Rus gas?,
(ii) US LNG => unfair competition?

Area of potential growth of Rus gas supplies to EU...

A.Konoplyanik, GAS WS2, Brussels, 29.03.2019

NRES=non-renewable energy sources
RES=renewable energy sources
CC(U)S=carbon capture, (utilization), storage/sequestration
Innovative low-emission methane-hydrogen scenario for the low-carbon EU energy future within its argued “Third EU energy vision”: three-steps of Gazprom’s/Aksyutin’s path

**Step 1:** Structural low-carbonization

**Step 2:** Technological low-carbonization based on existing technologies & infrastructure

**Step 3:** Deep technological low-carbonization based on innovative technologies’ breakthroughs

---

Rapid reduction of GHG emissions

Achieving the EU’s 2030 climate targets based on the existing gas infrastructure

Transition to hydrogen energy based on efficient low-emission technologies of hydrogen production from methane

The feasibility of the EU's challenging 2050 targets

---

**TOTAL GHG EMISSIONS IN THE EU, 2016**

<table>
<thead>
<tr>
<th>Carbon Source</th>
<th>Emissions (in billion t eq.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EX LU/LUCF</td>
<td>4.3</td>
</tr>
</tbody>
</table>

- **13-18%**
  - The switch from coal in power generation and petroleum motor fuels to natural gas
- **25-35%**
  - The use of methane-hydrogen fuel in energy and transport w/o costly infrastructural changes
- **~80%**
  - Rapid reduction of GHG emissions
  - Achieving the EU’s 2030 climate targets

---

The expert assessment is made on the basis of data on:
- Carbon intensity from different fuels (U.S. Energy Information Administration estimates);
- Carbon footprint of various motor fuels (European Natural gas Vehicle Association report, 2014-2015);
- EU GHG emissions (1990 – 2016 National report on the inventory of anthropogenic emissions by sources and GHG removals by sinks not controlled by the Montreal Protocol, IEA)

Low-carbon EU energy future & Russia-EU challenges & bifurcations: agenda for GAC WS2

1) All-electric (RES-based) vs. electric + gaseous (RES + decarbonised gases) EU energy future

2) RES + decarbonised gases: “RES (electricity) + RES (renewable gases)? [(H2 = P2G = green H2 only) + biogases] vs. RES (electricity) + RES (renewable gases) + non-renewable gases
   a. Green H2 = RES electricity (available tech, but small & not-bankable), or
   b. “Green” H2 = electricity from the grid (available tech, but not green)

3) RES + Decarbonised (renewable & non-renewable) gases: green H2 + blue H2 with CO2 vs. green H2 + blue H2 with/without CO2 => what “blue” H2 is?:
   a. Blue H2 with CO2 => CC(U)S needed => available tech, but more costly, less bankable (Norway’s path)
   b. Blue H2 without CO2 => no need in CC(U)S => not yet commercialized tech for H2(*), but can be less costly (since no CC(U)S), more bankable => Russia’s/Gazprom’s path (three-steps “Aksyutin’s path” - A.K.) => but in the common interests of both EU & Russia => to jointly commercialize (once again, now for H2) from current R&D?

4) Where to decarbonize within cross-border gas value chain?: upstream vs. downstream
   a. Upstream (in Russia) – not in multilateral interests
   b. Downstream (within the EU) – within multilateral interests

Green H2 (EU/CertifHy): generated by RES (Bio/Hydro/Wind/Solar) with carbon emissions 60% below the benchmark emissions intensity threshold (= GHG emissions of the hydrogen produced by steam reforming of natural gas representing 95% of current merchant market). Blue H2 (EU/CertifHy): created by NRES (Nuclear electricity/Fossil with CC(U)S i.e. with to-be-utilized CO2) with emissions below the same threshold => NOT considering Blue H2 without CO2 i.e. without CC(U)S !!! (seems to be general understanding within the EU)

In both cases emissions shall be less 60% of medium industry levels (under steam reforming), so both green & blue H2 under EU definitions have the same limit of GHG emissions and same influence on climate (*) except 1998-2001 in Canada for black carbon
SELECTION OF LOCATION FOR HYDROGEN PRODUCTION

80% CO2 emissions within Russia-EU cross-border gas value chain are downstream, at consumer end, within EU => low-carbonization downstream (at end-use, within EU) based on Russian gas export & (export of Russian, if commercialized & competitive) no-CO2 technologies of H2 production => fair competition, technological neutrality, mutual complementarity of “blue H2” technologies with (Norway/Equinor path => incl. CCS) & without (Russia/Gazprom path => no CCS) CO2 emission

GAS CHEMISTRY, ETC. ONLY
METHANE

POTENTIAL CONSUMERS OF DIFFERENT METHANE-HYDROGEN BLENDS
X % Y % Z %

CH4
H2

NATURAL GAS

GAS PRODUCTION
GAS TRANSPORTATION VIA PIPELINES

CONSUMERS OF HYDROGEN ONLY
HYDROGEN

Efficient technologies of H2 production without CO2 emissions


A.Konoplyanik, GAS WS2, Brussels, 29.03.2019
Thank you for your attention!

www.konoplyanik.ru
andrey@konoplyanik.ru
a.konoplyanik@gazpromexport.com

**Disclaimer:** Views expressed in this presentation do not necessarily reflect (may/should reflect) and/or coincide (may/should be consistent) with official position of Gazprom Group (incl. Gazprom JSC and/or Gazprom export LLC), its stockholders and/or its/their affiliated persons, or any Russian official authority, and **are within full personal responsibility of the author of this presentation.**