

# **COP-21 – role of NG in Decarbonization and Sustainability of EU economy**

Work Stream 2 “Internal Markets”, Russia-EU Gas Advisory  
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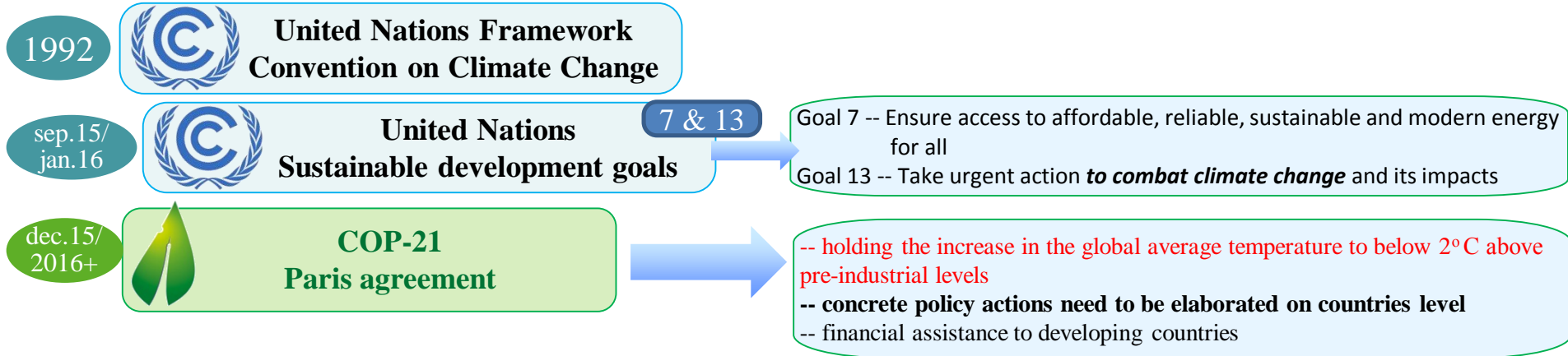
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# EU economy: decarbonization vs. sustainability

## CLIMATE POLICY

### International level



### National level: EU path

EU COM(2014) 15 (22.01.2014) Policy framework for climate and energy 2020-2030

Submission (to UN COP-21) by Latvia & European Commission (march 2015)

Energy Security Package (*winter package*) (2016+)

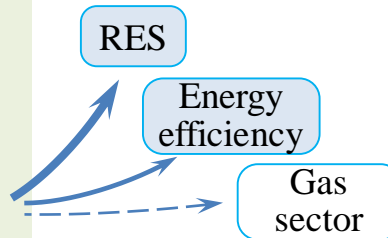
Revision of the Emission Trading System (ETS) (2016+)

### key targets for the year 2030:

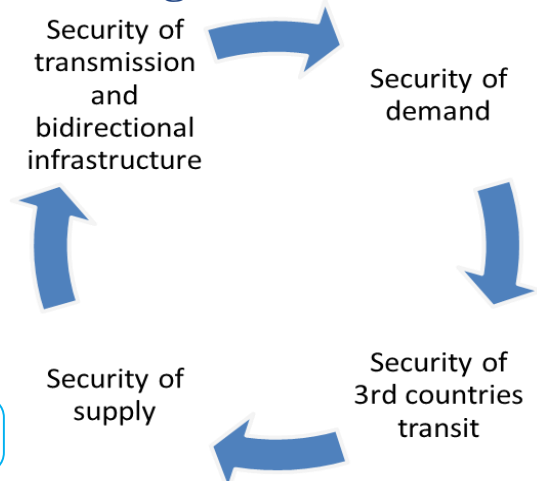
- ✓ at least 40% cuts in greenhouse gas emissions (from 1990 levels)
- ✓ at least 27% share for renewable energy
- ✓ at least 27% improvement in energy efficiency
- ✓ average annual additional investments are projected to amount to €38 billion for the EU as a whole over the period 2011-30

### key targets for the year 2050:

- ✓ cut emissions to 80% below 1990 levels
- ✓ interim milestone - cut emissions to 60% by 2040
- ✓ all sectors need to contribute

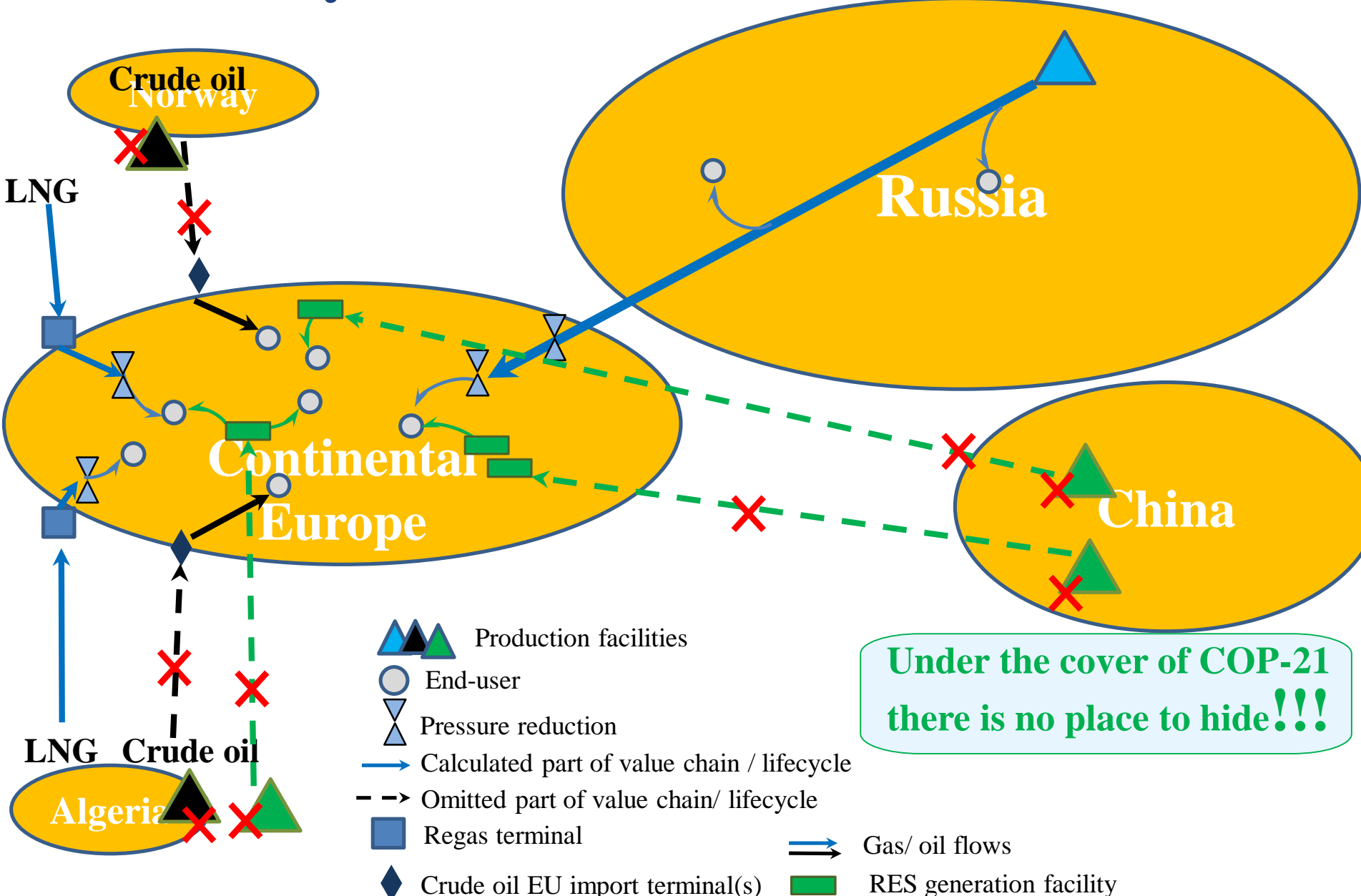


## Sustainable development cycle in gas sector



**Cycle integrity questionable on long-term horizon?**

# GHG & other emissions along different energy sources lifecycle – calculate or not to calculate





## NATURAL GAS VS COAL

### “INDUSTRY VIEW” - GAS TARGET MODEL REVIEW AND UPDATE AS OF 2015:

- Predicting “that **significant gas-fired generating capacity** is likely to be needed to provide flexible back up to renewable energy sources whilst also running at a far lower load factor than was previously the case”
- Gas-fired plants particularly **open cycle gas turbines** are able to provide **the flexibility** that is required in the reverse markets
- “Compared to other fossil fuels, **gas has a low CO<sub>2</sub> emission factor** (natural gas electricity generation can result **in half of the emissions of coal-fired** electricity generation)

## COAL VS NATURAL GAS

### FINDINGS OF PÖYRY STUDY AS OF JUNE 2016:

- “The “first-time-calculation” of **indirect emissions** (incl. production and transport) hard coal vs natural gas
- Fluctuating load in renewable energies lead to **partial load operation** of open-cycle gas turbines
- The total GHG emissions from open-cycle gas turbine power plants **can be as much as 76% higher** than those from hard coal-fired power plants
- Even if only the direct emissions are taken into account an open-cycle gas turbine plant in partial load operation emits **up to 29% more GHG** than a hard coal power plant
- The difference in GHG emissions between modern hard coal-fired power plants and **combined cycle power plants** declined from 36% during full load operation to **30% in partial load** operation

**FINDINGS OF THE US DEPARTMENT OF ENERGY ON LC GHG PERSPECTIVE ON EXPORTING LNG FROM THE US AS OF MAY, 29 2014\*:**

- The main conclusion: use of US LNG exports for power production in European and Asian Markets **will not increase GHG emissions**, on a LC perspective when compared to regional coal extraction and consumption for power production
- The US LNG and Russian NG produce essentially **the same amount of GHG emissions** on a **100-year** basis. The emissions from the steps involved in LNG are approximately equal to the pipeline transport emissions for the Russian NG. However when comparing on a **20-year** basis, the difference between the LNG und Russian NG cases are **significant** (ab.15%).
- This is driven by the pipeline contribution to the Russian NG GHG results



## SCIENCE VIEW

### FINDINGS OF KIT STUDY AS OF MARCH 2016:

- Karlsruhe Institute of Technology reveals relationship between oil and gas production in the USA and increase in atmospheric methane
- After a period of stagnation around 2000, atmospheric methane concentration started to rise again in 2007
- **At least 40% of the worldwide methane concentration increase after 2007** result from the growing production of oil and natural gas in the northern hemisphere
- Most of the oil and gas boom of the last decade has occurred in the USA. The findings contradict to official estimates of the US Environment Protection Agency that reports **constantly low or even decreasing methane emissions** from oil & gas sector during the past ten years
- Recently a related study made in the USA on the basis of satellite data showed an increase in American methane emissions by more than 30% between 2002 and 2014. Also this results contradicts to EPA`s statements of no significant anthropogenic methane emissions in the USA

## WHERE IS THE TRUTH?

- Estimations of lifecycle GHG emissions related to natural gas made mainly on vague assumptions and some uncertain averagings
- The key weak point in the LCA of NG - the methane leakage - originally emerged from the US shale phenomenon has been transferred on the whole NG in an exaggerated form
- Assumptions (in form of coefficients etc.) can not be applicable for detailed and real investigations
- There is a strong need for a reliable assessment on a stand alone basis for different gas sources with possible classification of NG of different origin
- **A primary focus on CO<sub>2</sub> without recognition of other pollutants (particles) do not correspond to the idea and spirit of COP-21 on climate protection and health damage elimination**

## NEXT STEPS: PRELIMINARY SUGGESTIONS

- Build-up a dialog on methodological aspects of the ETS revision and its influence on the future structure of the EU energy market
- Revision of EU-Russia energy road map 2050 with the focus on the most effective way of securing the Sustainable Development and achieving of COP-21 objectives (complimentary usage of natural gas and RES)
- Working out of the unified methodology of GHG emissions calculation for the gas infrastructure: exploration, production and transportation

**Thank you for attention!**