WORLD ENERGY COUNCIL

“Gas Perspectives”

Greece as Southern Europe & East Med Energy Gas Hub

Athens – September 27th 2017

THREE SCENARIOS AT GLANCE

WORLD ENERGY COUNCIL

Modern Jazz

Market-driven approach to achieving individual access and affordability of energy through economic growth.

- Market mechanisms
- Technology innovation
- Energy access for all

Unfinished Symphony

Government-driven approach to achieving sustainability through interanationally coordinated politics and practices.

- Strong policy
- Long-term planning
- Unified climate action

Hard Rock

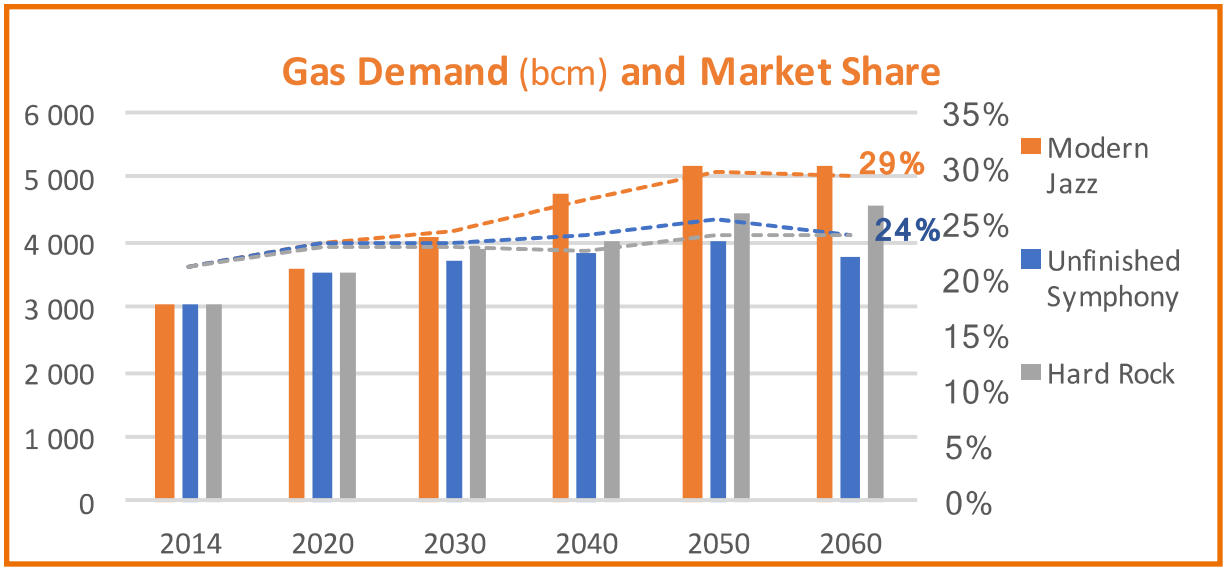
Fragmented approach driven by desire for energy security in a world with low global cooperation.

- Fragmented policies
- Local content
- Best-fit local solutions

Five major observations

1. A bright future at the global level until the middle of the century

- The only fossil fuel maintaining or increasing its share in the energy mix
- Over the whole period, a market share between 25 and 30%



- **Beyond 2050**, the **prospects are more uncertain**: a stagnant demand (Modern Jazz), and even significantly decreasing (Unfinished Symphony).

2. Very large differences between the scenarios

WORLD ENERGY COUNCIL

Modern Jazz

The first primary energy

- Market forces drive high **economic growth** in a competitive **globalised world** shaped by market mechanisms.
- **Awareness of environmental issues** increases
- Gas seen as **low-cost cleaner fuel** for power generation and transport.
- Rapid deployment of RES

- High growth (+70%) to 2050
- **5,000 bcm in 2050**
- **Flat after 2050**

Unfinished Symphony

The bridging fuel

- **Societal consensus on climate change** leads to effective Govt policy on Energy
- **Moderate economic growth**, **rising energy efficiency**, more **stringent emissions standards** and rapid **deployment of renewables** dampen growth for gas

- Low growth (+25%) to 2050
- **4,000 bcm in 2050**
- **Peak around 2050**

Hard Rock

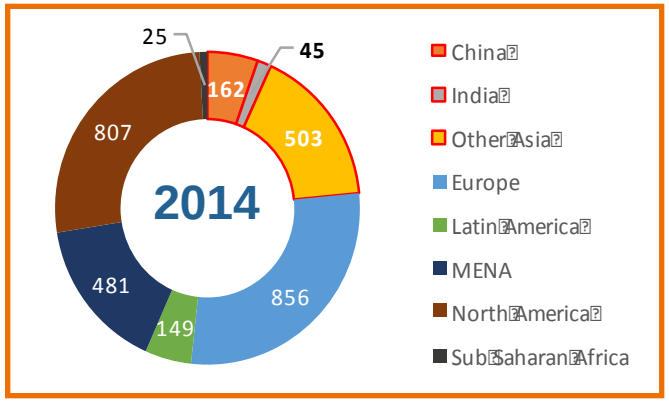
A major player

- Promotion of national agendas result in **low focus on climate change** and a **fragmented market**
- Energy shows **high dependence on fossil fuels** but gas growth is dampened by **coal remaining in the mix**

- Moderate growth (+50%) to 2050
- **4,400 bcm in 2050**
- **Continues to grow**

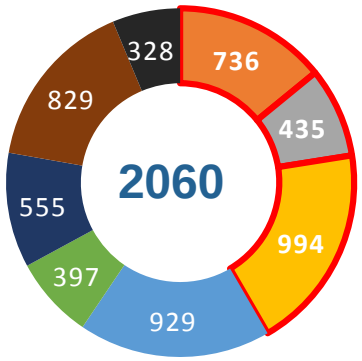
3. Massive shift in demand to Asia

- **Growth concentrated in new markets**
- **Asia**:
  - **21%** of global gas demand in **2014**
  - Between **30%** and **42%** in **2060**



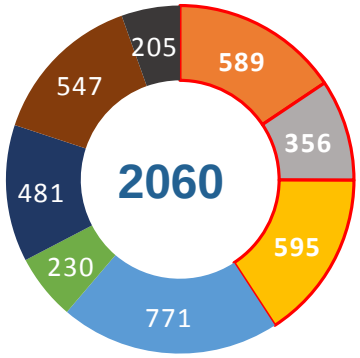
Modern Jazz

Asia 42%



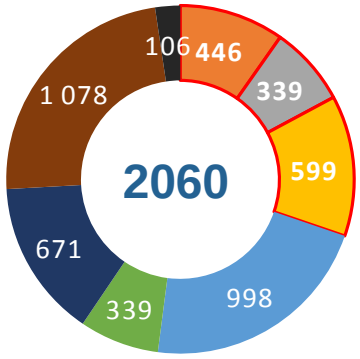
Unfinished Symphony

Asia 41%



Hard Rock

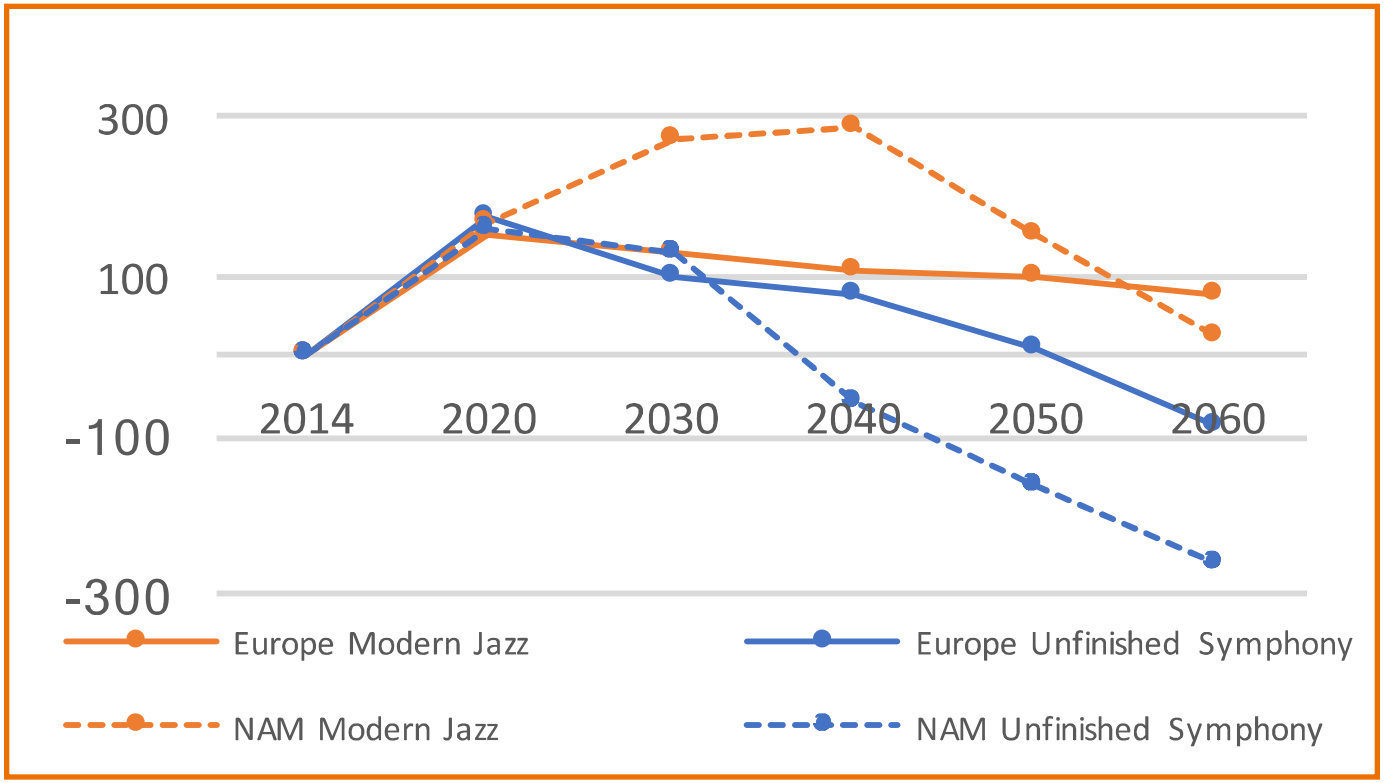
Asia 30%



Position possibly disputed in mature markets

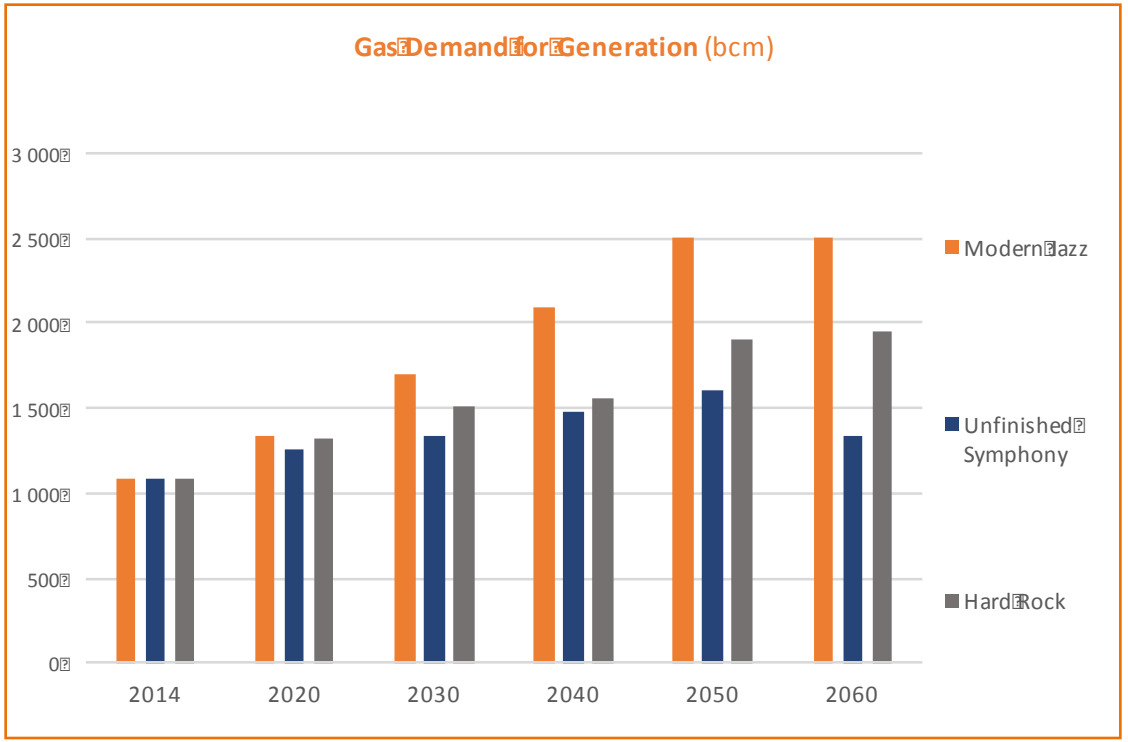
WORLD ENERGY COUNCIL

- **Peak demand** in Modern Jazz and Unfinished Symphony



4. Power generation: a crucial sector for gas

- Demand for electricity will **double by 2060**
- Huge gaps in additional gas demand: in 2050 **between 300 bcm and 1,500 bcm**
- In MJ and US: from 2040 **development of CCS will prove absolutely necessary** for the gas maintains a major role.



5. Gas is above all sensitive to climate concerns

WORLD ENERGY COUNCIL

- This sensitivity appears in the scenarios in two **different** and **opposite** ways.
- 1st phase until 2030: **gas development supported** by **climate policies** in Modern Jazz and Unfinished Symphony
  - **Share of gas** increase from 21% in 2014 to 24%
  - Gas benefits massively from substitution for coal in power generation
- 2nd phase: **strong climate policy** in Unfinished Symphony dramatically **limit gas role**
  - In 2050, gas demand: **- 25%** compared to **Modern Jazz**
    - 15% compared to **Hard Rock**

One central question

After 2050:

WORLD ENERGY COUNCIL

*Can gas **maintain a long-term role** in the energy mix or will it be a "**bridging fuel**" allowing a gradual but continuous evolution towards a decarbonised world?*

A bridging energy?

- Some signals **consistent with this hypothesis**:
  - Massive deployment of non-CO_2 emitting and increasingly competitive renewable energies including in emerging markets
  - Dynamic climate policy increases pressure on gas markets in Europe which could be experiencing peak demand for the 2020s
- Raises the question of the **value of gas resources** over the long term
  - Reserves are estimated at nearly 200 years.
  - If gas demand declines after 2040/2050, a significant proportion could become "stranded resources"

To remain a major energy gas must become a clean energy

WORLD ENERGY COUNCIL

- The gas sector must **innovate** to transform its **product**, its **modes of use** and its **markets**
- The gas must evolve towards "**renewable**" energy: biogas, P2G, etc.
- The **use of CCS technologies** will have to **become widespread**.
- In transport only a significant development in **the light-duty segment** can make transport a **real potential market** for gas

Thank you

Didier SIRE

sire@worldenergy.org