ACER workshop on the launch of updated the Gas Target Model

16 January 2015, Brussels
### Workshop Agenda

#### 1. Introduction
- Opening Remarks
- Workshop Organisation
- IEM in gas – regulators’ strategic work
- Completing the internal gas market

**Speakers:**
- Alberto Pototschnig, ACER Director
- Walter Boltz, Chair of ACER Gas Working Group
- Florian Ermacora, Head of Unit B2 Wholesale markets, electricity and gas, DG Energy, European Commission

#### 2. Security of Supply and upstream competition
- Enhancing security of supply and upstream competition – GTM recommendations

**Speaker:**
- Walter Boltz, Chair of ACER Gas Working Group

#### 3. Wholesale market functioning
- Measuring the status quo and metrics – quantitative analysis
- Self evaluation process and market integration tools – GTM recommendations

**Speakers:**
- Nathan Mcwhinnie, Ofgem
- Francesco Cariello, AEEGSI

#### 4. Role of gas in complementing RES electricity generation
- Better coordination between electricity and gas – GTM recommendations

**Speaker:**
- Johannes Heidelberger, BNetzA

#### 5. New developments in the gas supply chain
- New developments in the gas supply chain – GTM recommendations

**Speaker:**
- Dennis Hesseling, ACER

#### 6. Conclusions and closing of the workshop
Five key objectives for the Internal Energy Market (IEM) by 2025:

• Establishing liquid, competitive and integrated wholesale energy market
• Enhancing Europe’s security of supply and channeling the external element of IEM
• Moving to a low carbon society with increased renewables and smart, flexible responsive energy supply
• Developing a functioning retail market that benefits consumers
• Building stakeholder dialogue, cooperation and new governance arrangements

Part of this work is the review and update of the Gas Target Model
### Executive summary

#### 1. Introduction

- Demand/supply

#### 2. Context

- Demand/supply

#### 3. Security of supply and upstream competition

- Objective, status quo, recommendations

#### 4. Wholesale market functioning

- Objective
- Updated criteria, status quo
- Self-evaluation process
- Conclusions

#### 5. The role of gas in complementing RES electricity generation

- Objective, status quo, recommendations

#### 6. New developments along the gas supply chain

- Description of the technologies
- Growth forecast
- Recommendations

### Annexes
2. Security of supply and upstream competition

Walter Boltz, Chair of ACER Gas Working Group
Gas demand in Europe has decreased since 2008, and most projections predict a continuous decrease until 2025.
Europe is at a serious competitive disadvantage compared to North America and areas of the Middle East.
### Status quo

#### IEM as precondition for enhanced security of supply
- Priority of market-based measures
- Intervention only in specific cases (limited)

We maintained the following criteria developed in the GTM 2011:
- all Member States should try to reach a position in which their Residual Supply Index (RSI) exceeded 110%; and
- 3 supply sources

- 13 Member States do not meet the GTM target. These include almost all Eastern European states

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<th>RSI</th>
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<tr>
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</table>

| GTM target | ≥ 3 | ≥ 110% |
Measures to safeguard and increase existing gas sources

• Ensure that accessibility of existing gas sources is more geographically widespread

• Infrastructure investment decisions to adequately reflect value of improved SoS + upstream competition

• Physical reverse flow, spare capacity

• Ensure that Member States cooperate fully in a supply emergency and do not restrict cross-border flows to protect national interests
Measures to make appropriate use of storage and LNG

- Priority of market based measures and signals
  - Unbundling of storage products
  - System balancing prices to reflect value of lost load
  - Entry-exit tariffs to recognise role of storage
- In addition, regulatory intervention in the event of politically motivated physical supply interruption may be justified
- Associated interventions, e.g. through funding of PCIs
Measures to diversify upstream supply sources

• Incentivise European TSOs to jointly develop highly complex projects bringing gas from relatively distant / new geographies

• As last resort in case of overdependence on a particular source of gas legal limitation of the share taken from that source should be considered
3. Wholesale market functioning

Launch of the updated Gas Target Model
Contents

• Where we are today
• What is the driver and conceptual framework for the revised Gas Target Model metrics
• What those new metrics are, why we chose them, and what we haven’t included
### Status quo – vs GTM 2011 criteria

<table>
<thead>
<tr>
<th>Member state</th>
<th>Churn rate</th>
<th>Zone size (TWh/year)</th>
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<td>910</td>
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<td>950</td>
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**GTM target**
- Churn rate: ≥ 8
- Zone size: ≥ 215
- Number of sources: ≥ 3
- HHI: < 2,000
- RSI: ≥ 110

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Status quo:
Quantitative analysis reveals highly limited forward trading across the EU

Launch of the updated GTM, 16 January 2015, Brussels
What is the new approach?

• The key driver of the new metrics (and broader GTM work) is unchanged:
  Third Package requirement of ... “facilitating the emergence of a well-functioning and transparent wholesale market.” Article 1 of REGULATION (EC) No 715/2009 (gas transmission)

• GTM 2014, however is clear “well functioning” means a wholesale market with a liquid spot but also, crucially, a liquid forward and/or futures market
What is the broader conceptual framework to assess market functioning?

That a well-functioning wholesale market:

1. Meets “Market Participant Needs”. Products and liquidity are available that enable effective management of wholesale market risk.

2. Has “Market Health”. Wholesale market area is demonstrably competitive, resilient and has a high SoS.
## GTM2014 metrics: Informing the ‘Evaluation’

### Market Participant Needs
- Order book volume
- Bid offer spread
- Order book price sensitivity
- Number of trades

### Market Health - Competition, Security of Supply
- A Herfindahl-Hirshmann Index
- Different supply sources
- Residual Supply Index
- Market concentration for bid and offer activities
- Market concentration for trading activities

### GTM2011

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<tr>
<td>A Herfindahl-Hirshmann Index</td>
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<td>Different supply sources</td>
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<tr>
<td>RSI</td>
<td>&gt; 110% (&gt;95% of days/year)</td>
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<tr>
<td>Market zone size</td>
<td>&gt; 20 bcm</td>
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<tr>
<td>Metric</td>
<td>Rationale</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
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<tr>
<td>Order book volume</td>
<td>Sufficient volumes of gas for delivery of gas exist &quot;reasonably&quot; far into the future are bid and offered to support effective risk management.</td>
</tr>
<tr>
<td>Bid offer spread</td>
<td>Low bid offer spreads mean low transaction costs and support market participants who have less flexibility over when they can trade.</td>
</tr>
<tr>
<td>Order book price sensitivity</td>
<td>Lower sensitivity means lower costs for participants who need to transact substantial volumes and have less flexibility over when they can trade</td>
</tr>
<tr>
<td>Number of trades</td>
<td>Sufficient trading activity is necessary to give market participants confidence prices are transparent and represent a reliable market price.</td>
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</table>
“Market Health” metrics as per GTM 2011 with two additions

<table>
<thead>
<tr>
<th>Metric</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Market concentration for bid and offer activities</strong></td>
<td>The more competitive a market, the more likely, the market to have strong SoS, and work in the interests of energy consumers.</td>
</tr>
<tr>
<td><strong>Market concentration for trading activities</strong></td>
<td></td>
</tr>
</tbody>
</table>
Why not other metrics?

- Doesn’t fit our chosen conceptual framework. However, this doesn’t mean irrelevant or unimportant. Key examples include:
  - Churn
  - “spot price conversion”
- Why we choose threshold values based on TTF and NBP levels
Assessment against new criteria

Market performance target zone

Wholesale market performance 2013 (relative to TTF/NBP based thresholds)

Average metric value relative to TTF/NBP:
- Forward market
- Front month product
- Day-ahead product
- Minimum and maximum metric value relative to TTF/NBP

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Questions?
Self-evaluation process and market integration tools

GTM recommendations

Francesco Cariello - AEEGSI
A technical assessment - to be performed in each Member State - of the market situation based on the indicative criteria (revised metrics)

GTM invites regulators to perform such analysis on a regular basis – at least once every 3 years – with the involvement of relevant national authorities and stakeholders

Key question to be answered: the natural evolution of the market can reasonably be expected to meet the criteria?

Transparent, objective, inclusive process, in close cooperation with Member States and with stakeholder involvement
The process in brief

Analysis
- Periodic analyses by National Regulatory Authorities (NRAs) of market development
- Periodic analysis also to review achievements against commitments and proposals

Assessment
- Criteria not met: NRAs assess whether natural evolution is sufficient to meet criteria within 3-year period or more active intervention is required (incl. Network Code implementation)

Plan
- Where more active intervention required: NRAs propose – based on assessment – a plan to achieve target criteria (with Member States and stakeholder involvement, consultation, Cost Benefit Analysis-CBA)

Market integration tools
- Where market integration is considered the preferred option: GTM market integration tools (detailed CBA)

Surrogate measures
- Where none of these market integration options deliver a positive CBA: NRAs to propose equivalent surrogate measures

In all cases – regardless whether the market functioning criteria have been met – steps to **improve hub functioning** should be pursued

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GTM recommends – as a matter of best practice - some measures in order to promote key features which are considered to be highly desirable for an efficient gas market design: an adequate level of liquidity, a wide accessibility and the connection to a gas exchange.

- **improve liquidity** (spot and forward):
  - Code of conduct or Guidelines of good practice for the hub operator
  - Adoption of “market makers” in particular for markets highly concentrated or under development

- **improve accessibility**:
  - Licensing process as easy and “low cost” and “European” as possible
  - Admit also “non-physical traders”

- **central counterpart – gas exchange**:
  - Enabling more transparent transactions and reliable price signals
  - Efficient credit risk management (esp. through clearing houses)
As a result of the self-evaluation, if Member States is unlikely to have a functioning wholesale gas market by 2017, **structural market reform should be evaluated**.

- The market reform should be:
  - Sensitive and appropriate, designed to reach the objectives of “market health” and meeting “participants needs”
  - Subject to a rigorous cost-benefit analysis

- Option for structural reform may include, but are not limited to, the following **market integration tools**:  
  - Market merger
  - Trading region
  - Satellite market

- The GTM 2014 does not prescribe an exhaustive list, the right structural market reform should be rooted in the specifics of each situation (for example, **market coupling** can also provide a tool for an efficient connection of neighbouring markets)
Starting Point => two adjacent gas market area are directly connected and have at least one other relevant entry point from another gas market

Result => two neighbouring gas market areas fully merge their balancing zones and their VTPs

Main Advantages => integrated gas wholesale market (spot and forward) and integrated balancing zone incorporating all end users

Main drawbacks => metering, allocation and balancing rules need to be fully harmonized cross-border; strong regulatory cooperation needed; potential legislative action in both countries; cross-border inter-TSO compensation may be required
Starting Point: two adjacent gas market areas are directly connected and have at least one other relevant entry point from another gas market.

Result: two neighbouring gas market areas merge their VTPs but not their national end user balancing systems.

Main Advantages: integrated gas wholesale market (spot and forward); implemented quickly because no cross-border alignment of end user balancing rules are required.

Main drawbacks: potential synergies untapped; cross-border inter-TSO compensation may be required.
Satellite market

- **Starting Point** => a gas market area (the "satellite") neighbours another gas mkt ares (the "feeder") with a better functiong gas mkt

- **Result** => a gas market area (the "satellite") does not maintain/establish its own gas hub but co-uses the hub of its main directly neighboring gas market area (the "feeder")

- **Main Advantages** => integrated gas wholesale market (spot and forward); implemented easily and quickly because no cross-border alignment of mkt rules required; implementation only affect the mkt organization of the satellite; positive externality for the feeder

- **Main drawbacks** => potential synergies untapped; restrict application
For assessing the net benefits of a market integration or connection project, the following cost and benefit categories should be considered.

- **Investment effects**: additional investments needed and avoided investments (as some projects may become irrelevant under a wider market area perspective);

- **Implementation one-off costs**: project specific costs and costs for new entities to be created;

- **Network operating costs**: e.g. reduced system energy volumes and prices, impacts on fuel gas needs;

- **Gas price / trading efficiency**

- **Retail competition effects**

- **Operating costs for market participants**: efficiency gains, savings on hedging costs

- **Effects of additional capacity constraints**: reduced option value of transportation contracts
4. Role of gas in complementing RES electricity generation

Johannes Heidelberger, BNetzA
Gas fired power generation...
...non-intermittent and reliable
...flexible
...system, ancillary, balancing services
(inertia, reserve, reactive power, black start...)
...relatively low carbon (CCGT)
...relatively low fixed costs (OCGT)
Recommendations – Role of gas in complementing RES electricity generation

But...

...clean spark spreads down

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Gas capacity / tariff aspects

There are still market situations where gas fired generation would be efficient...

...however: almost unpredictable

Booking yearly or monthly gas exit capacity with a TSO?...

...a gamble ...rather close down plant (if there is no capacity remuneration mechanism in place)

Consequently: even less transport business for TSO...

...if generation could take place on Short term basis: win-win-win for generator, TSO, and market

Recommendation:
NC CAM style capacity products and draft NC TAR style tariffs (multiplier max 1.5) at exits to gas fired plant.
Gas capacity / tariff aspects

Day ahead capacity booking 16:30-17:00...

...by then, electricity balancing products not yet called (e.g. 4-hour strips within-day)

Electricity balancing market relatively profitable – no show stopper to charge full daily gas capacity tariff...

...but before the day, call of electricity balancing products is not yet known

Recommendation:

Look into application of within-day booking at exits to gas fired plant.
Aspects of gas balancing regimes

Participation in electricity balancing markets could require generation for only some hours of the day...

...therefore gas offtake structured: within-day-obligations potential issue

Within-day obligations serve to maintain system integrity...

...to be strictly limited to the technically absolutely necessary

...alternatively: allow online flow control (OFC / automated nomination) to network users with a flexibility source

Recommendation: Careful design of WDOs
Example: „tolerant“ within-day-obligation

Recommendations – Role of gas in complementing RES electricity generation

Entry Allocation  Exit allocation

Cumulated within-day deviation charged at buy-sell spread
Within tolerance of 7.5% on daily volume
Recommendations – Role of gas in complementing RES electricity generation

Example: Online flow control

Automated nomination according to offtake

Flex source (e.g. UGS)

Sink (e.g. CCGT)

Shipper account: balanced by definition

TSO

RLM data

Market Area

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Aspects of gas flexibility sources

Important flexibility source for unpredictable loads are underground storages...

...however, in some markets with regulated storage access, withdrawal capacity comes with hefty chunks of mandatory working gas volume

Requirement for gas fired power complementing RES is high capacity / low commodity

...therefore, flexible combinations of withdrawal capacity and WGV required

Recommendation: allow for tailored combinations of withdrawal capacity and working gas
Coordination aspects between gas and electricity systems and markets

TSO might require buffering and ramp rates...

...while electricity TSO needs balancing energy quickly (but there might be indications): early warning and information flows crucial

Exchange traded gas only available three hours from the next full hour...

...NC Balancing now requires half-hourly trade notification at VTP. Can exchanges shorten lead-time as well?

Recommendations: Improved information flows, cooperative review of industry timelines
5. New developments in the gas supply chain

Dennis Hesseling, Head of ACER Gas Department
Outline

- Description of new uses for gas
- Development prospects
- Recommendations
The new uses for gas have different roles across the gas supply chain

- Power-to-Gas
- LNG Virtual Pipelines
- CNG Virtual Pipelines
- Use of gas in land transport
- Use of gas in water transport

Virtual pipelines are closely related to the development of the use of gas in the transport sector, particularly in the case of LNG.
Gas can be used in vehicles either as CNG or LNG

- Natural gas has been in use as an alternative fuel for road vehicles since the 1930s.
- Natural gas has been gaining ground worldwide and in the EU due to a combination of stricter environmental requirements and low gas prices.
- Natural gas vehicles can be fuelled with either CNG (gas compressed at ~200 bar) or LNG (liquid natural gas at -162°C).

### CNG vs. LNG

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<th>CNG</th>
<th>LNG</th>
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<td>More easily available, especially through the gas network in urban areas</td>
<td>More energy content per volume (triple that of CNG)</td>
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<tr>
<td>Infrastructure cheaper to build</td>
<td>Superior autonomy</td>
</tr>
<tr>
<td>Flexible urban use</td>
<td>Requires continuous use (boil-off problem)</td>
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- Used mainly in urban transport (cars, taxis, buses, city service trucks, dailies)
- Used mainly by trucks travelling long distances

- Retrofitting of existing vehicles (with petrol or diesel motors) is possible to allow dual-fuel operation (gas/petrol or gas/diesel)
- There is a limited supply of new models (mainly dual fuel)
- EU Standards for LNG and CNG vehicles have already been issued (Regulation R-110, June 2014)
LNG stations are supplied through trucks; CNG stations are supplied either from the network or with LNG (L-CNG)
New regulations in the water transport sector favor the use of LNG-fuelled ships

The International Marine Organization (IMO) is imposing restrictions to the allowable level of SOx in marine fuels’ emissions (MARPOL 73/78 – Annex IV):

- In SOx Emission Control Areas (SECAs): 0.1% as of 1/1/2015
- In IMO members’ territorial seas: 0.5% as of 1/1/2020

EC has adopted these restrictions with Directive 2012/33/EC

Existing and potential new ECAs

Ship owners have three choices in order to meet the new requirements, particularly in SECA regions:

- Use of HFO and install an exhaust scrubber.
- Switch to MGO or other low sulphur fuel, such as the Ultra-Low Sulphur Fuel Oil.
- Switch to LNG.

- LNG is an attractive fuel choice, particularly if its future price differential with HFO it could be used in non-SECA areas as well.
- The use of LNG however is dependent on the availability of sufficient bunkering infrastructure to allow ship refueling.
Depending on the available infrastructure and size of ships there are three options for LNG bunkering:

- **Ship-to-Ship (STS)**: applied to ships with a bunker volume in excess of 100 m³ (bunker vessel’s capacity 1,000 – 10,000 m³)
- **Truck-to-Ship (TTS)**: applied to ships with a bunker volume below 200 m³.
- **Terminal-to-Ship (TPS)**: applied to ships of all bunker sizes. Close proximity to the terminal is required.

Source: German Ministry of Transport and Digital Infrastructure
The supply chain of LNG bunkering is the same for applications in deep-sea trading and inland waterways.
The concept and approach are the same for both CNG and LNG virtual pipelines...

A virtual pipeline is defined as the supply chain transporting natural gas to final consumers in the form of CNG or LNG, using road and sea means of transportation, such as trucks, vessels, and rail.

Usually, virtual pipelines are used:

- For gasification of regions, to create a critical mass of consumption prior to development of a transmission system
- Where construction of transmission systems is not economically or technically feasible
...but their applications differ
Power-to-Gas (P2G) is an energy storage technology linking the electricity and gas infrastructure.

- P2G is currently at a **pilot development phase** (most applications in Germany with over 15 pilot and demonstration projects).
- The output of the P2G process (hydrogen or synthetic methane) mainly depends on the **gas system limitations for hydrogen injection** (currently not an issue).
- The future commercial deployment of P2G is expected to be used for absorbing **curtailed renewable energy** and acting as a **balancing tool** by the electricity TSOs.

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**Technical characteristics**

- Current capacity of P2G units reaches 2 MW.
- Units can be stacked for larger capacity.
- Hydrogen output: 4 – 8 kWh/Nm3 H₂.
• Description of new uses for gas

• Development prospects

• Recommendations
Aggregated new use of gas could constitute 3-15% of EU gas consumption in 2025, transport sector largest growth potential.

* Water transport: Data used are projections for 2020

** Power-to-Gas: Hydrogen output converted to natural gas equivalent, using GCV of Russian gas

*** Virtual pipelines: Supply of CNG and LNG filling stations not included in the values
Growth of NGVs is driven mainly by low gas prices

- The introduction of stricter regulations by the EU concerning pollution and tailpipe emissions and the plans to minimize dependency on oil favour the development of a market for alternative fuels in transport.

- NGVs fuelled with CNG have to compete with the “established” fuels (petrol & diesel) as well as with other alternative technologies (electric, hydrogen fuelled and LPG fuelled cars).

- For trucks driving long-distances LNG is currently the only practical choice of alternative fuel, competing only against diesel.

- The growth of NGVs is driven mainly by the low prices of gas in the present and the medium-term future.

- Penetration of natural gas depends on comparative fuel prices, convenience to the drivers (e.g. autonomy, availability of sufficiently wide network of filling stations), incentives, and availability of models from vehicle manufacturers.
Deployment of NGVs depends on economics & infrastructure

Factors influencing further growth of NGVs in the EU

- EU and State policies
- Infrastructure (filling stations)
- Harmonised standards
- Availability of new vehicles

A prerequisite for growth is to ensure (through a sustained taxation regime favorable to gas) that a sufficient price differential between gas and oil products continues to exist.

- Financial and fiscal incentives can also be helpful in promoting penetration of CNG and LNG in road transport.

- Presently the network of CNG stations in most EU MS is limited.
- LNG stations are very few and missing in key countries.
- Plans for expansion exist and new stations are been built. The Alternative Fuels Infrastructure (AFI) Directive aims to develop the required network of stations throughout the EU but sets no quantitative targets.

- EU technical standards for CNG & LNG vehicles exist since 6/2014
- International standards (ISO) for filling stations are under development and due in 2016. The AFI Directive authorizes the European Commission to assure that standards are established.

- Currently the range for new NGV models available (mainly dual fuel) is limited for both LDVs and HDVs and includes models by few manufacturers.
Gas consumption in the land transport sector can be significant in the next decade, provided that the appropriate conditions for market development exist.

### CNG in road transport (Cars & LDVs)

- **Low scenario:**
  - Bcm: 0.60
  - Penetration rates for LDVs: 1%

- **Base scenario:**
  - Bcm: 8.30
  - Buses: 3%

- **High scenario:**
  - Bcm: 23.90
  - Buses: 7.5%
  - Cars & LDVs: 10%

### LNG in road transport (HDVs)

- **Low scenario:**
  - Bcm: 3.5
  - Penetration rates for HDVs: 1%

- **Base scenario:**
  - Bcm: 17.3
  - Penetration rates for HDVs: 10%

- **High scenario:**
  - Bcm: 34.5
  - Penetration rates for HDVs: 20%
The development of an LNG market as fuel for ships is highly dependent on its price level compared to HFO

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>LNG World Consumption (bcm)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>11.29</td>
<td>Price of LNG assumed to be 110% of HFO</td>
</tr>
<tr>
<td>Base</td>
<td>19.68</td>
<td>Price of LNG assumed to be 70% of HFO</td>
</tr>
<tr>
<td>High</td>
<td>44.85</td>
<td>Price of LNG assumed to be 30% of HFO</td>
</tr>
</tbody>
</table>

Price differential LNG to HFO

- Low scenario: 3.5 Bcm
- Base scenario: 6.1 Bcm
- High scenario: 13.9 Bcm
A large part of the expected size for virtual pipelines is linked to the development of the use for gas in transport.

For CNG virtual pipelines:
- Low scenario: 2.57 Bcm (0.34 Bcm supply of off-grid CNG filling stations, 2.23 Bcm supply of remote regions)
- Base scenario: 3.76 Bcm (0.96 Bcm supply of off-grid CNG filling stations, 2.80 Bcm supply of remote regions)
- High scenario: 5.83 Bcm (2.39 Bcm supply of off-grid CNG filling stations, 3.44 Bcm supply of remote regions)

For LNG virtual pipelines:
- Low scenario: 8.25 Bcm (3.50 Bcm supply of LNG filling stations, 3.20 Bcm supply of remote regions, 1.55 Bcm supply to markets with wide network)
- Base scenario: 24.46 Bcm (5.08 Bcm supply of LNG filling stations, 2.08 Bcm supply of remote regions, 2.08 Bcm supply to markets with wide network)
- High scenario: 43.81 Bcm (17.30 Bcm supply of LNG filling stations, 6.70 Bcm supply of remote regions, 2.61 Bcm supply to markets with wide network)
The output of P2G is expected to be limited in 2025.

The examined time period is only 3 years after the expected full-scale commercial deployment of the P2G technology. Maturity of the application and a larger integration of RES in the EU-wide power system could lead to larger market sizes post 2030.
• Description of new uses for gas
• Development prospects

Recommendations
Key points to be addressed

• Which of these activities should be regulated (in particular loading/bunkering activities at LNG storage facilities)

• LNG and CNG filling stations should not be considered as suppliers of gas, and consequently should not be subject to TPA or licensing procedures

• A level-playing field between piped and non-piped supplies must be facilitated, in order for gas-to-gas competition to take place if the market demands it

• Particularly in the case of P2G: the technical provisions for the injection of hydrogen and synthetic gas into the gas system, the pricing regime, the role of the P2G operators, the balancing aspect and the integration in the electricity system
## Recommendations

<table>
<thead>
<tr>
<th>New development</th>
<th>ACER/NRA position</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNG virtual pipelines</td>
<td>• The national distribution Network Codes foresee supplies with CNG virtual pipelines, including clear provisions as to the connection of CNG shipments and dispatching of gas from CNG containers</td>
</tr>
<tr>
<td>LNG virtual pipelines</td>
<td>• Examine the appropriateness of establishing an EU-wide approach for cases where LNG storage and loading facilities should be regulated</td>
</tr>
</tbody>
</table>
| CNG/LNG in land transport        | • Ensure that CNG and LNG filling stations are considered end customers rather than gas suppliers, and therefore they are not obliged to conform to the requirements imposed on gas suppliers  
• NRAs will include the supply of gas to the filling stations in their market monitoring practices |
| LNG in water transport           | • Establish a common approach setting out whether and when the bunkering of a vessel with LNG is a regulated activity or not  
• Where the loading service provided by the LNG terminal is unregulated, enforce provisions accounting for the use of assets for both regulated and unregulated activities and reductions to the operator’s RAB, where appropriate |
| Power-to-gas                     | • Examine the regulatory framework and the impact of P2G technology, particularly as a tool for electricity balancing and demand-side response         |
6. Conclusions and closing of the workshop

Dennis Hesseling, Head of ACER Gas Department
Link to the Gas Target Model:

Thank you for your attention!

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