The Role of LNG – RWE’s Experience

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RWE Group – Who are we?
One of the Top 5 European Utilities…

RWE Core Markets

United Kingdom
Netherlands
Luxembourg
Germany
Austria

Leading Positions in Core Markets

<table>
<thead>
<tr>
<th>Product Market</th>
<th>Electricity</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>No. 2</td>
<td>No. 3</td>
</tr>
<tr>
<td>UK</td>
<td>No. 4</td>
<td>No. 4</td>
</tr>
<tr>
<td>NL</td>
<td>No. 2</td>
<td>No. 1</td>
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<tr>
<td>Eastern Europe</td>
<td>No. 2 in Hungary</td>
<td>No. 1 in the Czech Republic</td>
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<tr>
<td></td>
<td>No. 3 in Slovakia</td>
<td>Leading position in Hungary</td>
</tr>
<tr>
<td></td>
<td>Active in Poland</td>
<td>Active in Slovakia</td>
</tr>
<tr>
<td>Total Europe</td>
<td>No. 3</td>
<td>No. 6</td>
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</tbody>
</table>

*) Market positions of the RWE Group in terms of sales.
...with a growing upstream and LNG position in the Atlantic Basin
The Future of Gas Markets – What do we believe?

Gas Market Scenarios

“Evolution”
- Economic recovery in the mid-term
- Oligopolistic behaviour of international producers preserves oil-linked pricing being predominant for imports

“Competitive revolution”
- Current gas oversupply results in full competition and gas-to-gas pricing for imports
- Erosion of gas prices to long-run marginal costs

“Climate heaven”
- Strict climate policy induces long term stagnation/decrease of global gas demand
- Predominantly oil-linked import pricing mechanisms

Gas spot markets remain volatile and continue to become more liquid in all scenarios

Most likely

Possible
LNG connects previously independent gas regions to a global market

- Pricing support from coal displacement
- Major pipe exporters sales strategy & tactics
- China & India demand elasticity
- Pace of global economic recovery
- Pace of production curtailment
- Qatar's sales strategy & tactics
- Global LNG outages
- Crystallisation of pre-FID LNG projects

Source: Wood Mackenzie Global Gas Service
What is the contribution of LNG?

**Flexibility**
- LNG supply is not physically linked to a specific destination
- Ships can be re-routed flexibly, providing options for regional arbitrage and thus procurement from the cheapest market

**Security of Supply**
- LNG allows diversification of supply sources, e.g. LNG enables supplies from the Middle East to Europe
- No commitment of (mid-/downstream) infrastructure to one specific supplier

**Access to gas markets**
- Regional markets without access to pipeline gas can be supplied via LNG with potentially lower capex and lower barriers (e.g. resulting from international agreements required for pipelines)
“Flexibility becomes the name of the game” – volatility as key risk and source for value creation

> LNG infrastructure usage can be highly volatile (assuming the absence of long-term commitments)
On-board regasification is ideally suited for managing volatility and accessing new markets

### Onshore Regasification

- Investment of approx. 1 Billion €, high fixed operational costs
- Large space required
- Significant impact on environment (e.g. storage)
- Planned lifetime of 25 years

### “Excelerate Energy” On-Board Regasification

- LNG regasification (through heating) on board of the LNG vessel
- Reduced investments of only 10% of onshore terminals, low operational costs
- Very limited space requirements
- Reduced infrastructure (e.g. no storage) and reduced environmental burdens

**On-Board Regasification avoids large investments in fixed landing infrastructure and thus allows for economic operations even with limited utilisation rate (e.g. seasonal or spot deliveries only)**
Innovative infrastructure concepts – Example LNG gas supply to the Middle East

> The gas demand varies substantially in Middle East countries over the year – with a winter low and a summer peak

> Even though most countries in the Region remain net-exporters throughout the year, they increasingly depend on gas imports in the summer

> Utilising LNG to meet peak demand represents a flexible, clean and economic solution

Mina Al-Ahmadi (Kuwait) GasPort

> Project completed August ‘09
> Terminal owned and operated by Kuwait National Petroleum Company
> Excelerate / RWE acts as EPC contractor for entire construction
> Concept to commercial operations in only 24 months
Summary

> RWE is an up- and midstream centred gas player with a focus on Europe and the Atlantic Basin

> We believe that liquidity and volatility of gas markets will increase – whatever the precise development of e.g. oil-indexation may be

> LNG connects previously independent regional gas markets

> “Flexibility will become the name of the game” for LNG infrastructure

> RWE has build up a flexible portfolio of mid- and upstream assets

> RWE/Excelerate’s flexible on-board regasification technology is ideally suited to access new markets at low cost and provides a maximum of flexibility for any LNG portfolio