A CCGT Fleet in continuous evolution
8th International Gas Turbine Conference

Pedro Lopez Estebananz
Director of Operations CCGT
12th October 2016
Agenda

- Uniper – an Introduction
- Key external drivers
- Understand and Adapt
- CCGT focus areas
- Our Adaptations
- The Outlook
Agenda

Uniper – an Introduction

Key external drivers

Understand and Adapt

CCGT focus areas

Our Adaptations

The Outlook
We are an experienced international energy company with a new name

- We are Uniper: An international energy company with about 14,000 employees and active in more than 40 countries.
- Headquartered in Düsseldorf, Germany, Uniper ranks among large generation (32 GW installed capacity) and trading companies in Europe, which is one of the world’s most important energy markets. Through our commodity-trading and technology-services businesses, we are also active in energy markets from the Americas to Asia.
- Our core markets are Germany, the United Kingdom, Sweden, France, the Benelux countries and Russia.
Agenda

Uniper – an Introduction

Key external drivers

Understand and Adapt

CCGT focus areas

Our Adaptations

The Outlook
Recent market developments challenge us all and change technology merit order in some markets.

Efficiencies (% net): Coal (39%) CCGT (55%)

(Source: Intercontinental Exchange)
Energy revolution and political decisions put pressure on power companies

- Significant reduction of energy prices; both fuel and energy cost on long-term low
- Trading prices signaling no recovery in short-term
- Substantial impact by political and regulatory decisions
- Ongoing discussions about future shape of energy markets represent significant risks and opportunities
Need for flexible and reliable back-up capacity
Capacity Mechanisms to support security of supply

1. Net cost of new entry based calculation of OCGT’s levelised costs less its expected revenues from the energy and balancing markets
2. 100% of capacity registered in the auction (5.5 GW)
Agenda

1. Uniper – an Introduction
2. Key external drivers
3. Understand and Adapt
4. CCGT focus areas
5. Our Adaptations
6. The Outlook
Uniper needed to understand and adapt to its markets to sustain the value of its units

**Understand**
- Understand current asset situation and the range of future requirements
- Focus on market, commercial and technical requirements of the asset

**Adapt**
- Paths of adaptation identified sets the requirement and need to adapt to the future
- Action is needed at each power plant to ensure it is fit for the future

**Survive and Grow**
- Implement actions across the fleet as identified to ensure survival
- Refocus on understand to identify growth areas in existing markets
Once you understand the market for a CCGT you can focus on a number of key areas:

- **Capacity**
- **Availability**
- **Reliability**
- **Flexibility**
- **Efficiency**
- **Cost**

Power plants have 6 basic technical parameters (CARFEC) that can be optimised:

- Technical Fossil plant parameters
- Cost base
- Commercial parameters
- People and culture

All parts of the organisation must work together.

As an operator, the first step is to understand the current and future market.
Agenda

1. Uniper – an Introduction
2. Key external drivers
3. Understand and Adapt
4. CCGT focus areas
5. Our Adaptations
6. The Outlook
Vision Unipers CCGT-Fleet

“The Fleet for Energy Transition and Beyond”

- Sustainable Value Contribution
- Delivering Excellent Operations
- Ahead in Innovation
- A Strategic Partner
- Through Our People
Agenda

Uniper – an Introduction

Key external drivers

Understand and Adapt

CCGT focus areas

Our Adaptations

The Outlook
Focus on asset profitability and value creation remains a priority

**Annual asset evaluation process**

- **Plant-by-plant review**
  - Cash flow / profitability
  - Mid-term market environment
  - Synergies across assets

- **Value maximisation**
  - Cost management
  - Plant availability
  - Maintenance investments

- **Cash flow positive?**
  - Yes
  - No

- **Action**
  - Mothballing
  - Closures
  - Other options

**Historical capacity closures (GW)\(^1\)**

- 2012: 2.6
- 2013: 0.8
- 2014: 3.3
- 2015: 2.1
- Total: 8.8

**Value proposition**

- Further streamlining the portfolio
- Sweating the assets
- Cutting discretionary investments

---

1. Closure dates refer to end year of operating life time
Competitiveness in OM costs becomes decisive under capacity payment schemes

**Approach**

- Uniper undertakes annual *internal benchmarking* that enables the power plant to see how it is performing compared to its peer. Each plant has a performance improvement plan to set some clear improvement goals.

- **Risked-based Operations and Maintenance Excellence response (ROME)** enables Uniper to have a transparent view on costs vs. risk appetite supporting a market-based budgeting process.

- **Risk and opportunity projects** are prioritised using the output from Uniper’s in-house Risk Management process “AERO” to limit our spend understanding and controlling the risks.

- **Condition based maintenance and GT part life extension projects** implemented after thorough in-house engineering process to quantify additional technical risk.

**Example**
Our holistic view on raising flexibility based on market needs

1. Market
   - Market demand
   - Value of flexibility parameters

2. Commercial constraints
   - Contractual issues
   - Warranties/guaranties

3. Technical constraints
   - Design limits
   - E.g. maximum load

4. Asset integrity
   - Material boundaries
   - E.g. temperature, gradients

Flexibility enhancement

<table>
<thead>
<tr>
<th>Parameter</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weighting Multiplier</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sustainable Value Contribution

Less Flexible

More Flexible
Operational Excellent framework to consistently operate and maintain our assets

Uniper Operational Excellence (OE) System

- 5S – Clean and organized workplaces
- Lean Processes
- Resource Planning Tools
- Interactive Trainings and Simulations
- Performance Boards
- Competency Frameworks
- Leaders Vision
- Challenging the Status Quo
- Coaching Sessions

OE Enablers

- Aligned HR Processes
- OE Maturity Assessments

Delivering Excellent Operations
Systematic approach on improving reliability

1. **Value impact**
   - Market impact imbalances, lost op
   - Incremental maintenance costs

2. **Commercial and technical constraints**
   - Reliability rules in contracts and markets
   - Optimum operational setup for reliability

3. **Reliability Culture**
   - RCA standardization
   - Enhance Capabilities
   - Sharing and learning
   - Ambitious targets

4. **Advance tools**
   - Advanced condition monitoring
   - Digitalization

Delivering Excellent Operations

Weighted Cyclic Events (WCE) per Start
Uniper has focused on asset innovations that drive market value… but innovation continues

**Approach**

- Uniper have focused on understanding our markets and delivering improvements to our assets that meet market needs
- Technology developments with the OEM’s are also a key part of our success
- Areas of improvement include:
  - Start up time
  - Lifetime extension
  - Improving local acceptability
  - Removal of known engine issue

**Example**

![Graph showing commercial FLP hot start vs. normal commercial hot start at Connal](image)

Status of Lead Engine Projects vs Technology Funnel
Uniper’s Third Party Service offers capabilities developed as an Asset Owner and Trader

- Owner’s perspective to focus on commercial value
- Experience in sustainable cost reduction & market related performance improvements
- Leverage scale benefits as owner of large asset fleets
- Technology independent O&M expertise
- World-class in-house engineering capabilities
- Ability to bundle with Trading, Commodity Supply and Risk Management capabilities

→ We leverage our “Owners Approach” to deliver Customer Value...
People matter! Uniper focuses on Talent and Professional Engineering Development

The benefits of professional development to Uniper
- Demonstrates the quality of our people as well as processes to assure customers of our competence
- Motivates our people, showing that we actively promote and support continuous professional development

The support provided:
- A move away from classroom teaching
- Focus on coaching - throughout the company
- Reemphasis on line management responsibility for talent development
- Investing in individuals
- Evidences education, training, competence and experience
- Advice from our dedicated support team in the Uniper Engineering Academy
- Mentor/mentee pairing service
- Access to events programme – networking /technical seminars/workshops
Agenda

Uniper – an Introduction

Key external drivers

Understand and Adapt

CCGT focus areas

Our Adaptations

The Outlook
Conclusions

• The European Market conditions have been extremely challenging for Generators over the last years, driven by volatile and uncertain global commodity prices, a demand contraction, continuous renewables growth and political intervention

• Uniper responded to the challenges by understanding and adapting its fleet to the market and regulatory conditions

• CCGT technology is supporting and enabling the European Energy transition and it would continue to do so if the right stimulus exists

• We cannot anticipate what other external events might impact us in the future and we need to be able to react flexibly again to the challenges that may come

• A proactive and continuous evolution of our CCGT fleet will drive value and allow us to survive and grow in this challenging environment
Uniper – a new name for energy

Energy has a new name
Disclaimer

This document and the presentation to which it relates contains information relating to Uniper SE, ("Uniper" or the "Company"), which is a 100 % fully consolidated subsidiary of E.ON SE, that must not be relied upon for any purpose and may not be redistributed, reproduced, published, or passed on to any other person or used in whole or in part for any other purpose. By accessing this document you agree to abide by the limitations set out in this document. This document is being presented solely for informational purposes and should not be treated as giving investment advice. It is not, and is not intended to be, a prospectus, is not, and should not be construed as, an offer to sell or the solicitation of an offer to buy any securities, and should not be used as the sole basis of any analysis or other evaluation and investors should not subscribe for or purchase any shares or other securities in the Company on the basis of or in reliance on the information in this document. The Company has not decided finally whether to proceed with any transaction. We advise you that the financial information presented herein has been derived from the combined financial statements of Uniper which have been prepared and not from the financial statements of E.ON Group. Certain information in this presentation is based on management estimates. Such estimates have been made in good faith and represent the current beliefs of applicable members of management. Those management members believe that such estimates are founded on reasonable grounds. However, by their nature, estimates may not be correct or complete. Accordingly, no representation or warranty (express or implied) is given that such estimates are correct or complete. We advise you that some of the information presented herein is based on statements by third parties, and that no representation or warranty, express or implied, is made as to, and no reliance should be placed on, the fairness, accuracy, completeness or correctness of this information or any other information or opinions contained herein, for any purpose whatsoever. Certain statements contained herein may be statements of future expectations and other forward-looking statements that are based on the Company's current views and assumptions and involve known and unknown risks and uncertainties that may cause actual results, performance or events to differ materially from those expressed or implied in such statements. No one undertakes to publicly update or revise any such forward-looking statement. Neither Uniper, E.ON SE or any of their respective officers, employees or affiliates nor any other person shall assume or accept any responsibility, obligation or liability whatsoever (in negligence or otherwise) for any loss howsoever arising from any use of this presentation or the statements contained herein as to unverified third person statements, any statements of future expectations and other forward-looking statements, or the fairness, accuracy, completeness or correctness of statements contained herein. In giving this presentation, none of Uniper, E.ON SE or their respective agents undertake any obligation to provide the recipient with access to any additional information or to update this presentation or any information or to correct any inaccuracies in any such information. Any decision to purchase shares or any other securities should be made solely on the basis of information contained in any prospectus that may be published by the Company and which would supersede this document and information contained herein in its entirety. This presentation is not intended to provide the basis for any evaluation or any securities and should not be considered as a recommendation that any person should subscribe for or purchase any shares or other securities.