



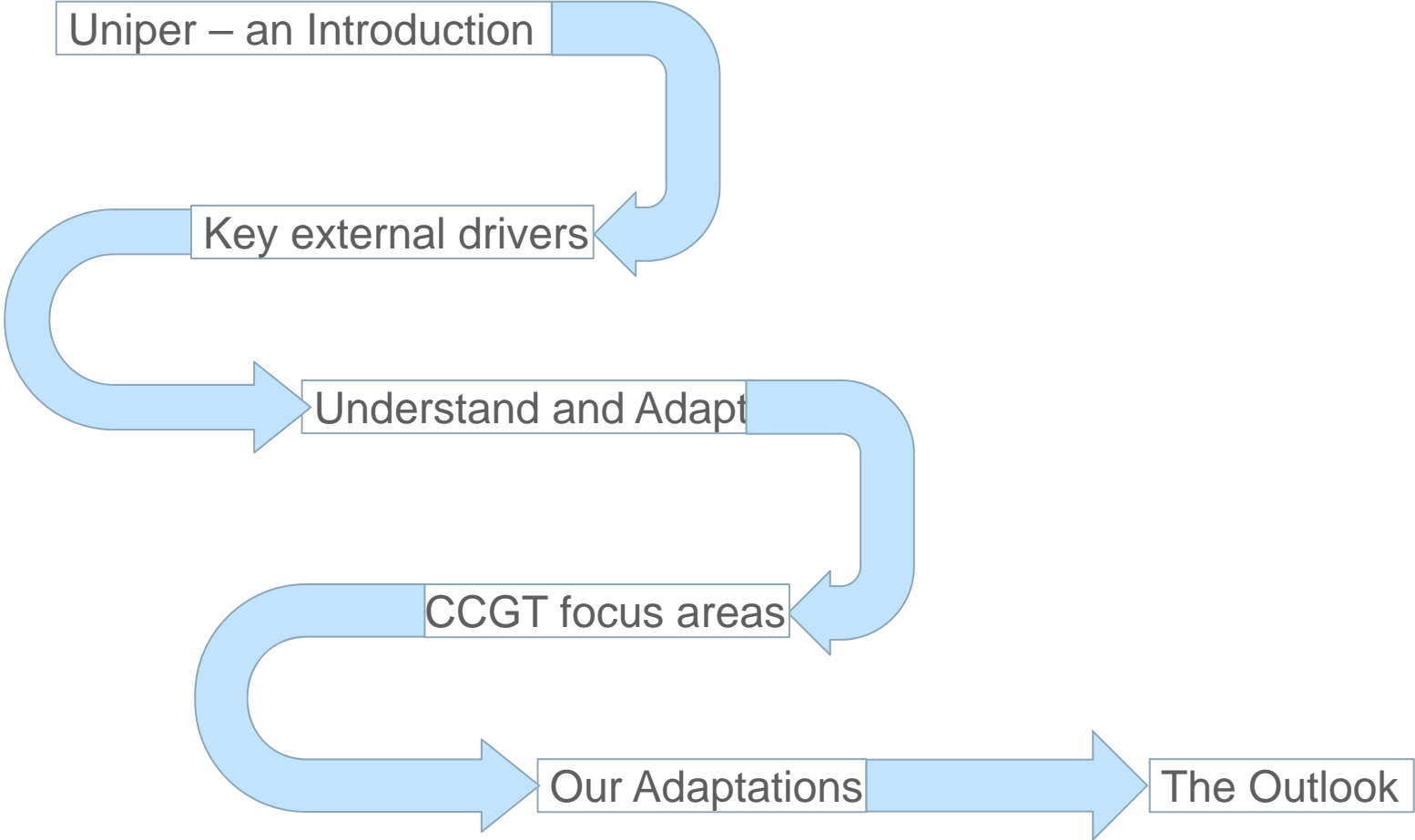
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**A CCGT Fleet in continuous evolution**  
**8<sup>th</sup> International Gas Turbine Conference**

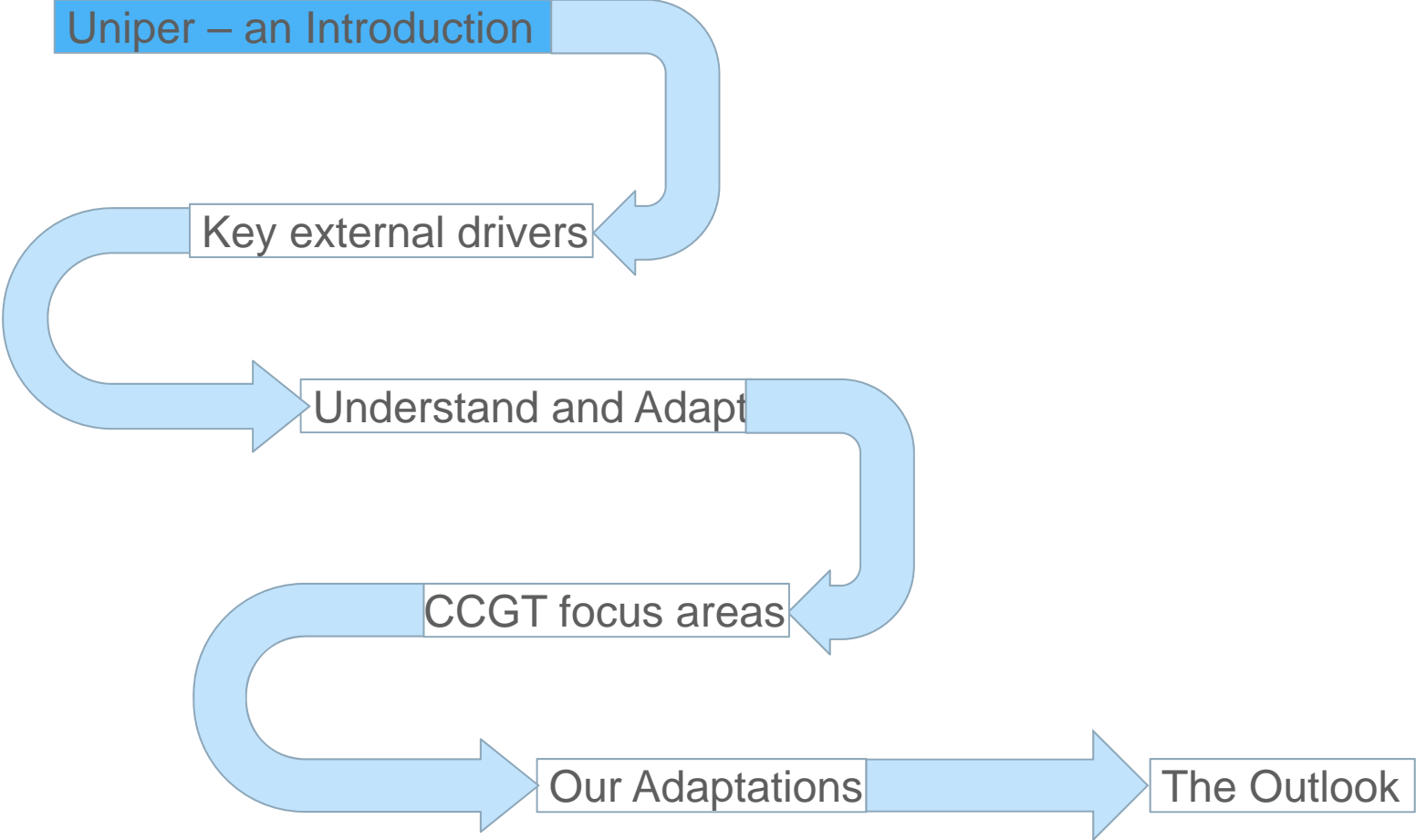
Pedro Lopez Estebarez  
Director of Operations CCGT  
12<sup>th</sup> October 2016



# Agenda

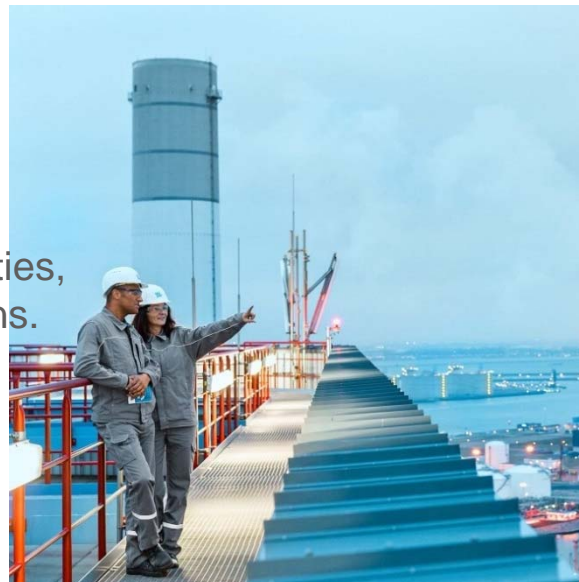


# Agenda

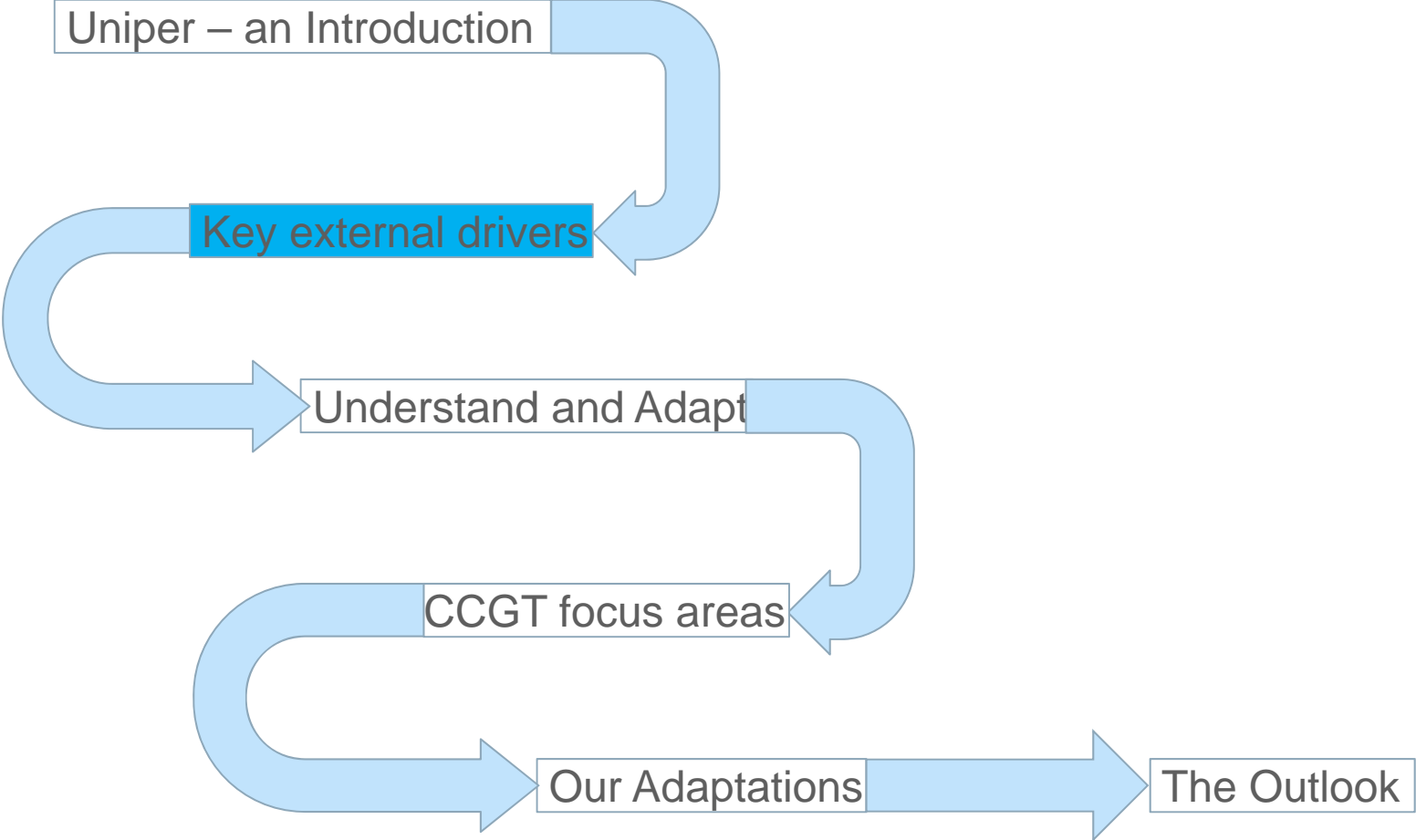


# We are an experienced international energy company with a new name

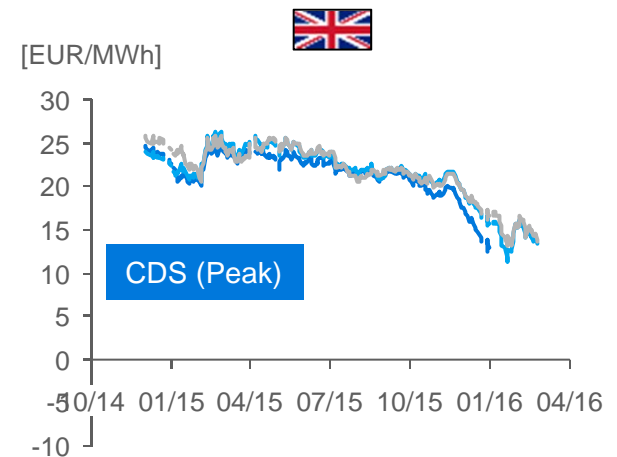
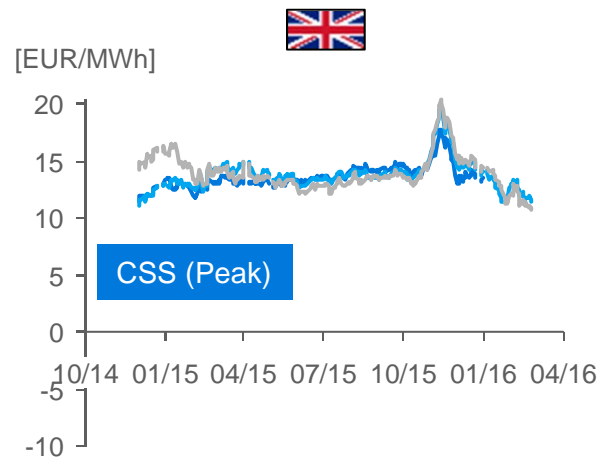
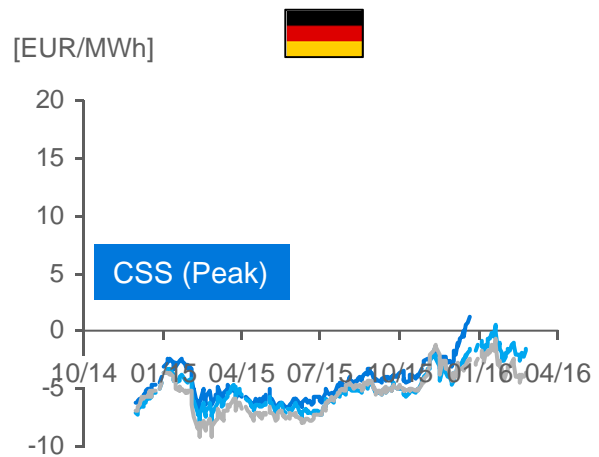
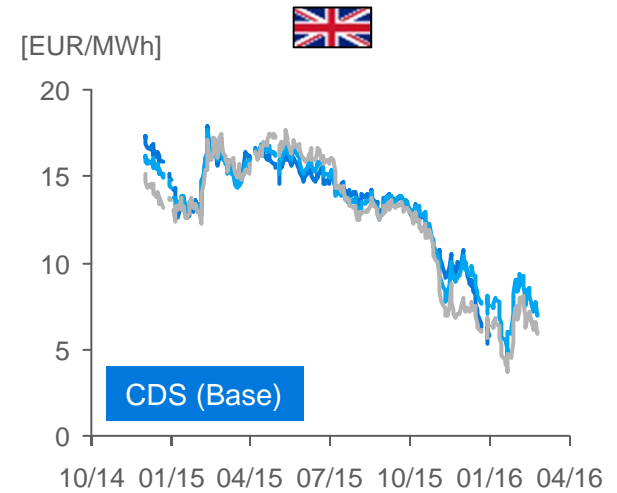
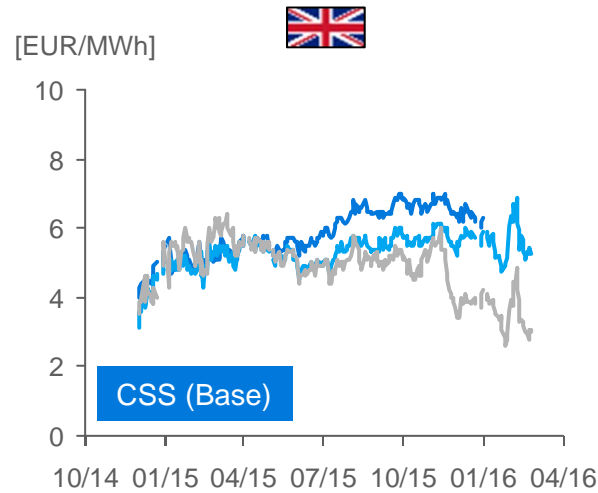
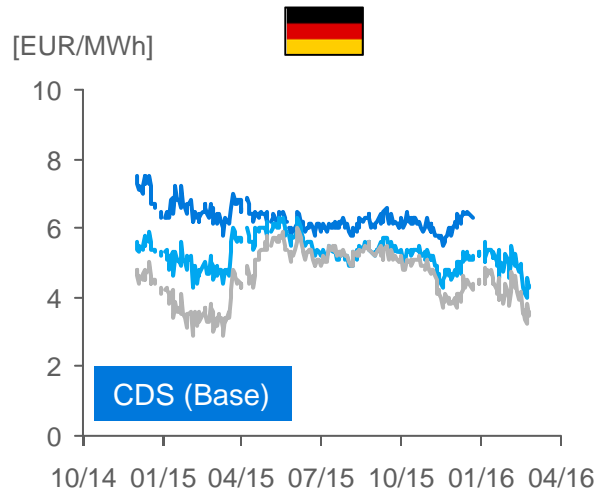
- We are Uniper: An international energy company with about 14,000 employees and active in more than 40 countries.
- Headquartered in Düsseldorf, Germany, Uniper ranks among large generation (32 GW installed capacity) and trading companies in Europe, which is one of the world's most important energy 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.
- Uniper Business portfolio includes Power Generation, Global commodities, Energy Storage and Energy Solutions.



# Agenda



# Recent market developments challenge us all and change technology merit order in some markets

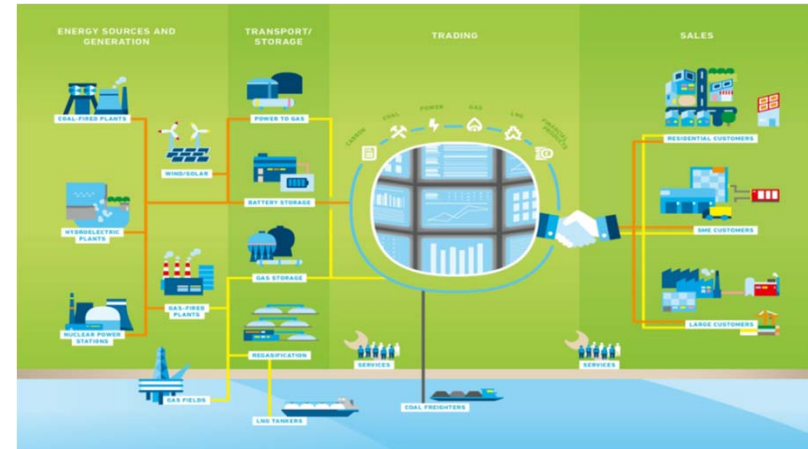


— 2016 — 2017 — 2018  
 Efficiencies (% net) : Coal (39%) CCGT (55%)



# Energy revolution and political decisions put pressure on power companies

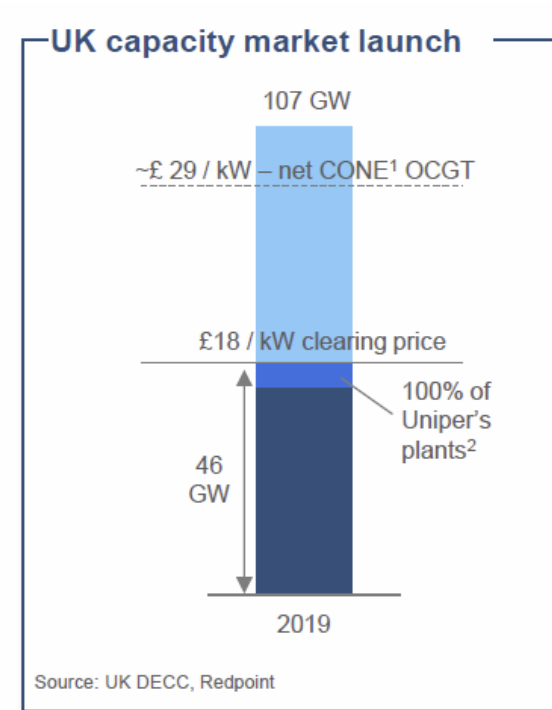
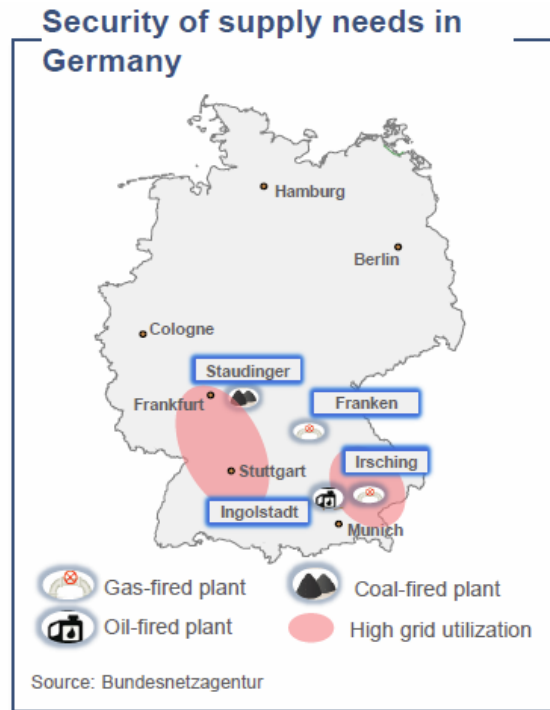
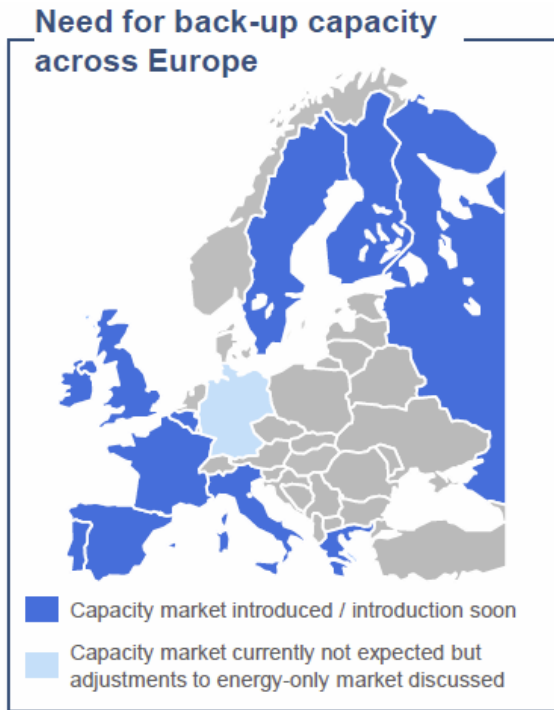
- Significant reduction of energy prices; both fuel and energy cost on long-term low
- Trading prices signaling no recovery in short-term
- Substantial impact by political and regulatory decisions
- Ongoing discussions about future shape of energy markets represent significant risks and opportunities





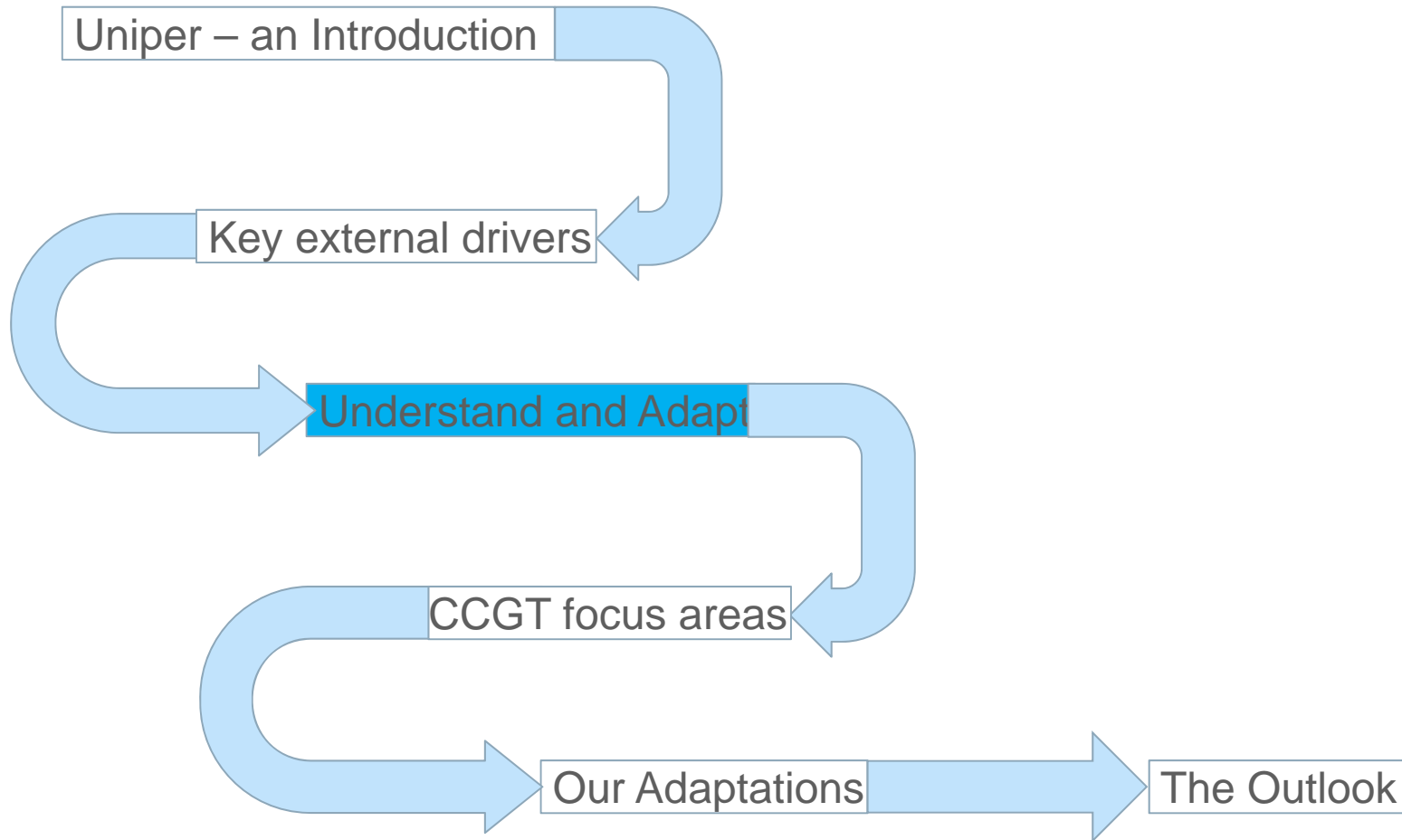
# Need for flexible and reliable back-up capacity

## 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



# Uniper needed to understand and adapt to its markets to sustain the value of its units

## Understand

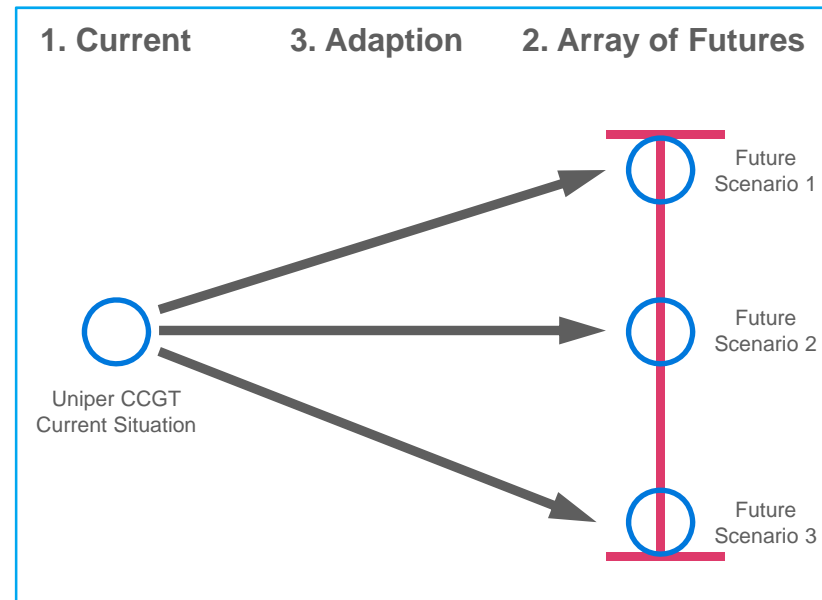
- Understand current asset situation and the range of future requirements
- Focus on market, commercial and technical requirements of the asset

## Adapt

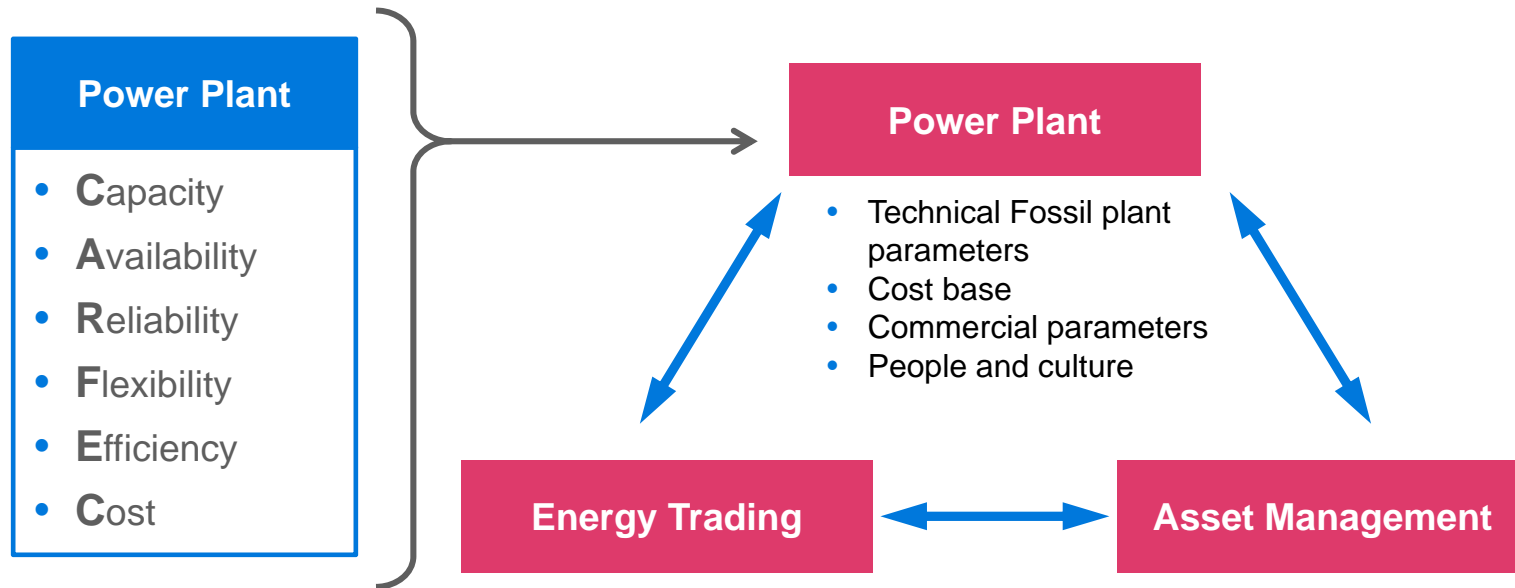
- Paths of adaptation identified sets the requirement and need to adapt to the future
- Action is needed at each power plant to ensure it is fit for the future

## Survive and Grow

- Implement actions across the fleet as identified to ensure survival
- Refocus on understand to identify growth areas in existing markets

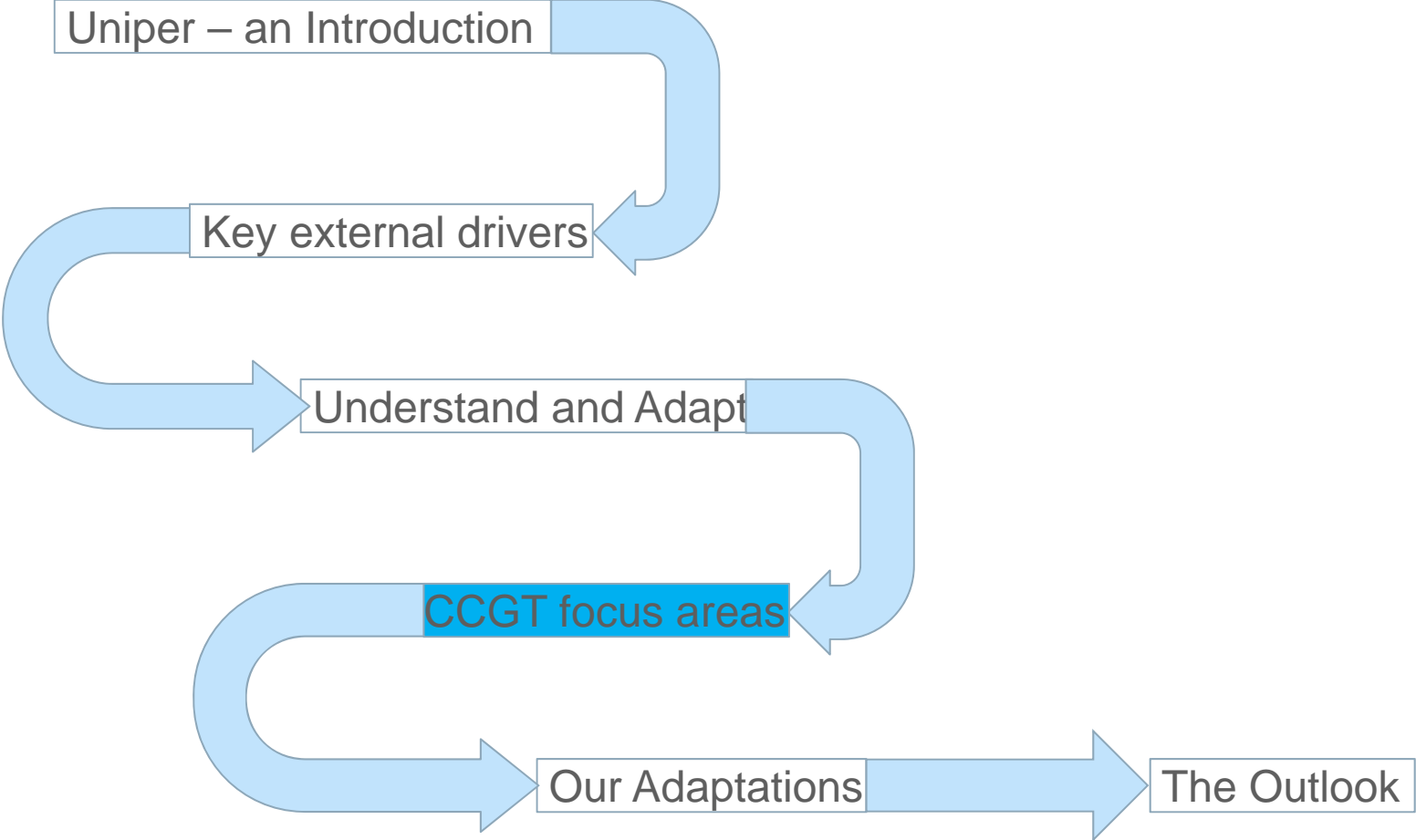


# Once you understand the market for a CCGT you can focus on a number of key areas

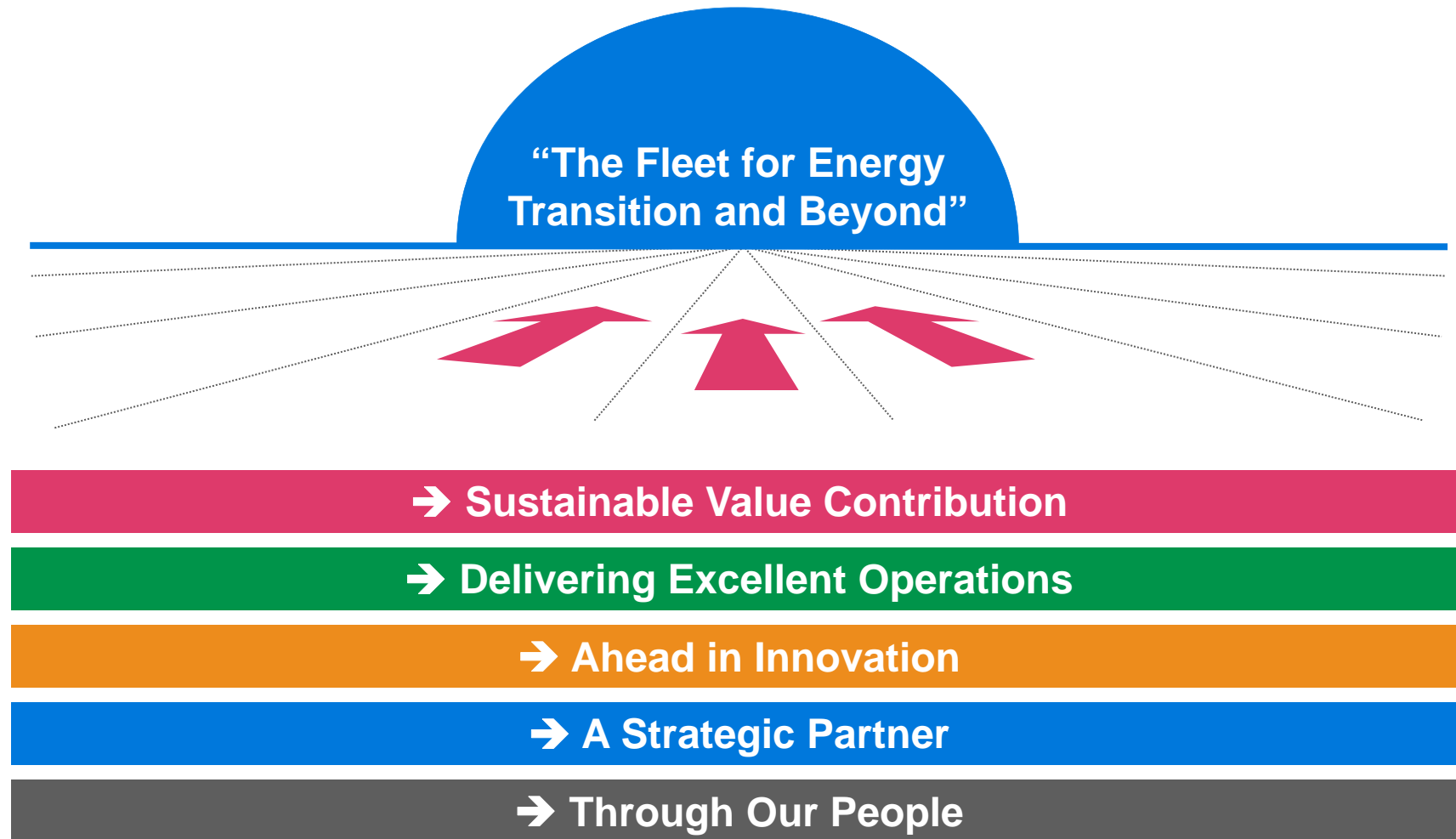


- Power plants have 6 basic technical parameters (CARFEC) that can be optimised
- All parts of the organisation must work together
- **As an operator, the first step is to understand the current and future market**

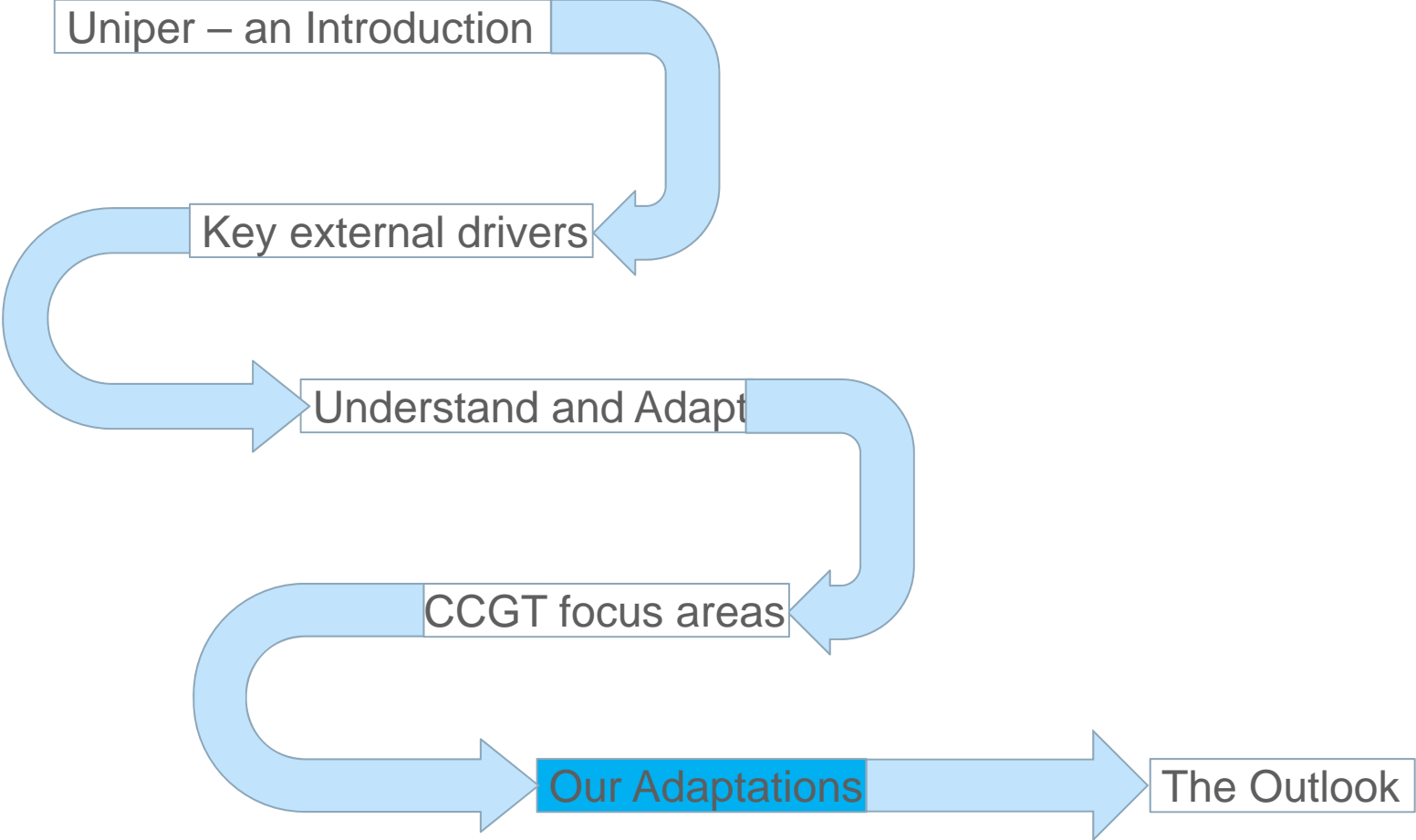
# Agenda



# Vision Unipers CCGT-Fleet



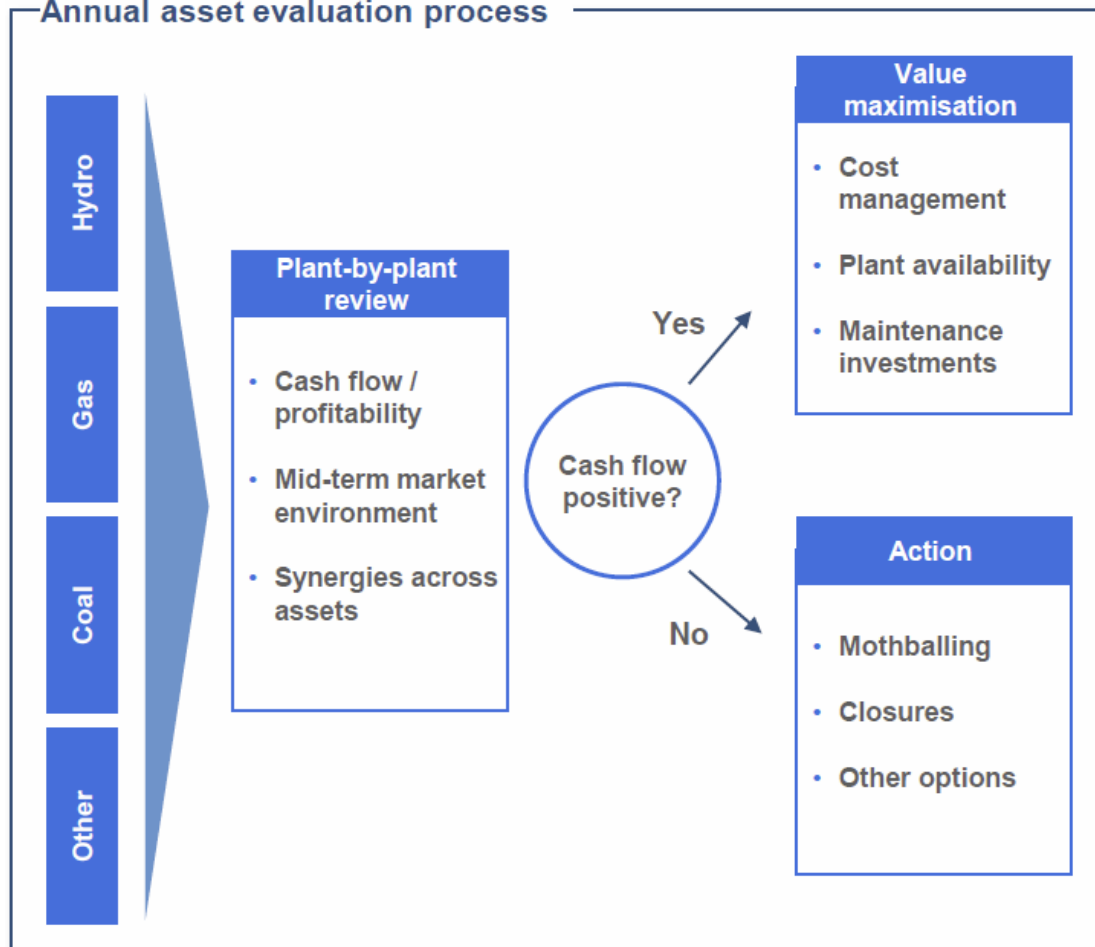
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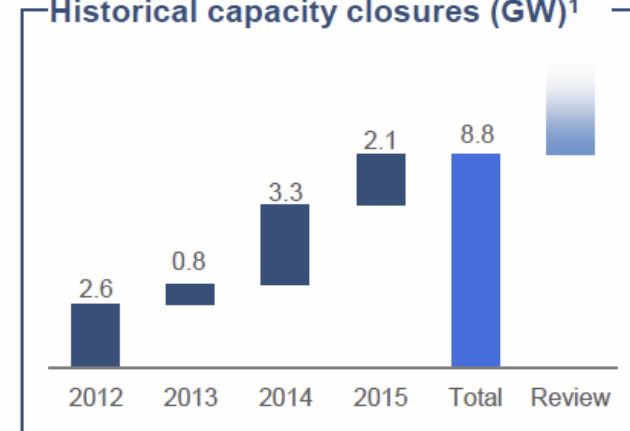


# Focus on asset profitability and value creation remains a priority

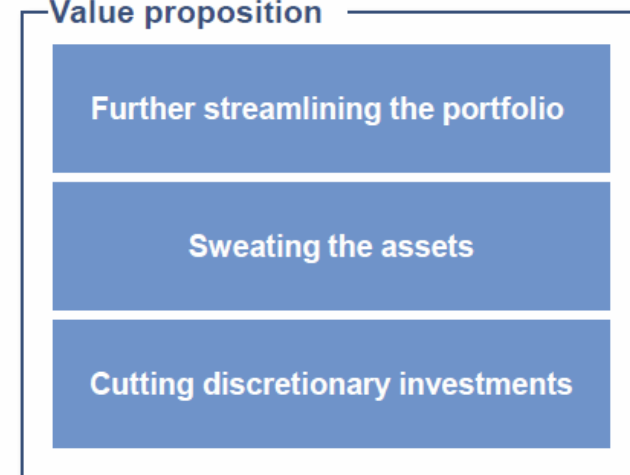
Annual asset evaluation process



Historical capacity closures (GW)<sup>1</sup>



Value proposition

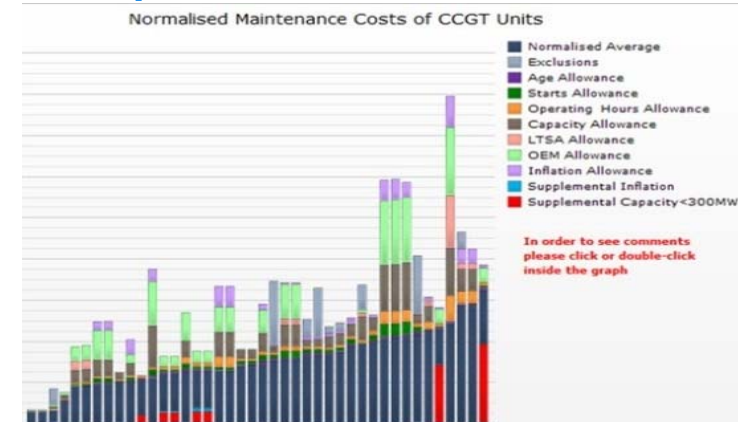


# Competitiveness in OM costs becomes decisive under capacity payment schemes

## 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
- **Risk-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



		A	B	C	D	E
		Negligible	Minor	Moderate	Significant	Severe
E	Very Likely	Low Med	Medium	Med Hi	High	High
D	Likely	Low	Low Med	Medium	Med Hi	High
C	Possible	Low	Low Med	Medium	Med Hi	Med Hi
B	Unlikely	Low	Low Med	Low Med	Medium	Med Hi
A	Very Unlikely	Low	Low	Low Med	Medium	Medium

# Our holistic view on raising flexibility based on market needs



## 1 Market

- Market demand
- Value of flexibility parameters

Parameter <sup>1)</sup>	Unit	A	Multiplier				Max score
			0	1	2	3	
NDZ	Mins	A	>=xmins	<ymins	<zmins	...	O
Average RURE from 0 to SEL Hot	MW/min	B	<-xMW/min	<yMW/min	<zMW/min	...	P
Average RDRE from SEL	MW/min	C	<-xMW/min	<yMW/min	<zMW/min	...	Q
RDRE/RURE above SEL	MW/min	D	<-xMW/min	<yMW/min	<zMW/min	...	R
SEL as a % of Base Load	%	E	>=x%	<y%	<z%	...	S
Synch Interval	Mins	F	>=xmins	<ymins	<zmins	...	T
F.R (Primary range @ 0.5hz)	MW	G	<-xMWhrs	<yMWhrs	<zMWhrs	...	U
F.R (Secondary range @ 0.2hz)	MW	H	<-xMWhrs	<yMWhrs	<zMWhrs	...	V
F.R (High range @ 0.5hz)	MW	I	<-xMWhrs	<yMWhrs	<zMWhrs	...	W

- Material boundaries
- e.g. temperature gradients

## 4 Asset integrity



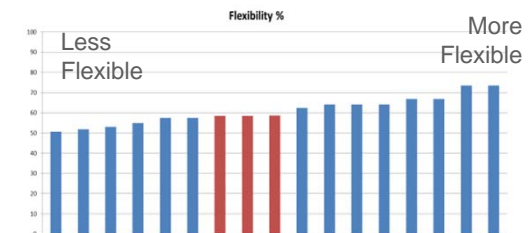
- Design limits
- e.g. maximum load

## 3 Technical constraints

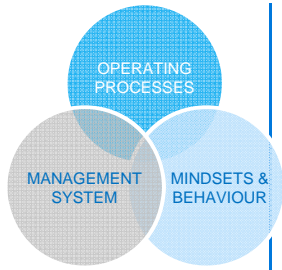
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## 2 Commercial constraints

- Contractual issues
- Warranties/guaranties



# Operational Excellent framework to consistently operate and maintain our assets



## Uniper Operational Excellence (OE) System

OPERATING PROCESSES

### 5S – Clean and organized workplaces

### Lean Processes

### Resource Planning Tools

MANAGEMENT SYSTEM

### Interactive Trainings and Simulations

### Performance Boards

### Competency Frameworks

Overall Competency Profile for:		Final Agreed Rating				
Competency	Sub-Competency	1	2	3	4	5
Health, Safety & Environment	Demonstrate safety and production Health, Safety & Environment (HSE) delivery and leadership					
	Drive and challenge current practices to improve HSE performance					
Drive Commercial Performance	Demonstrate compliance and drive for best practice within the HSE governance frameworks					
	Add value by optimizing and driving within the commercial and financial context					
Continuous Improvement & Quality	Drive financial performance					
	Proactively manage suppliers / contractors					
Drive Technical Performance	Champion a structured Continuous Improvement 'framework'					
	Enhance quality					
Project Management	Build a learning organization using knowledge management					
	Drive operational as a technical and complex command					
	Optimizing technical risks and opportunities					
	Expertise in Project Management / Project Management Tools					

MINDSET & BEHAVIORS

### Leaders Vision

### Challenging the Status Quo

Are you too busy to improve?

### Coaching Sessions

## OE Enablers

### Aligned HR Processes



### OE Maturity Assessments

# Systematic approach on improving reliability



## 1 Value impact

- Market impact imbalances, lost op
- Incremental maintenance costs



- Advanced condition monitoring
- Digitalization

## 4 Advance tools



- RCA standardization
- Enhance Capabilities
- Sharing and learning
- Ambitious targets

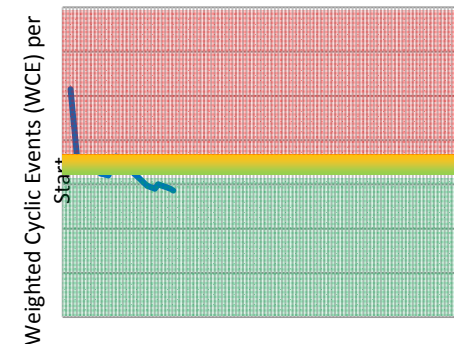
## Reliability Culture

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Reliability  
Zero trip philosophy

## 2 Commercial and technical constraints

- Reliability rules in contracts and markets
- Optimum operational setup for reliability

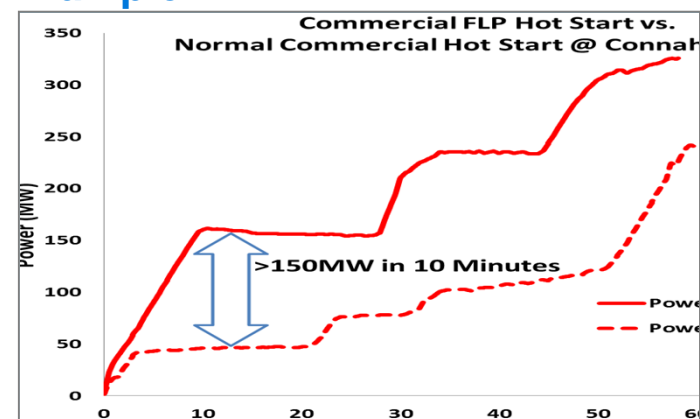


# Uniper has focused on asset innovations that drive market value... but innovation continues

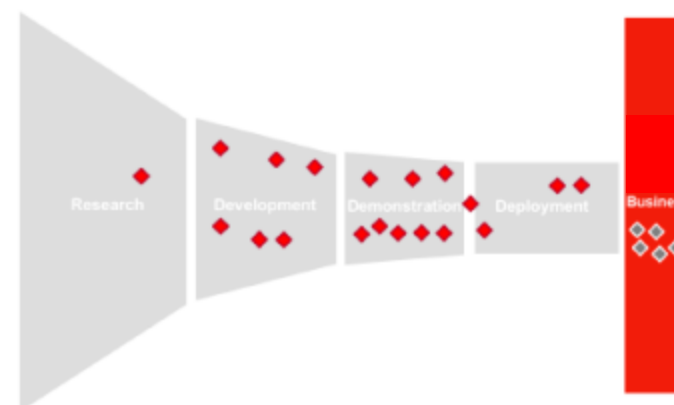
## Approach

- 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



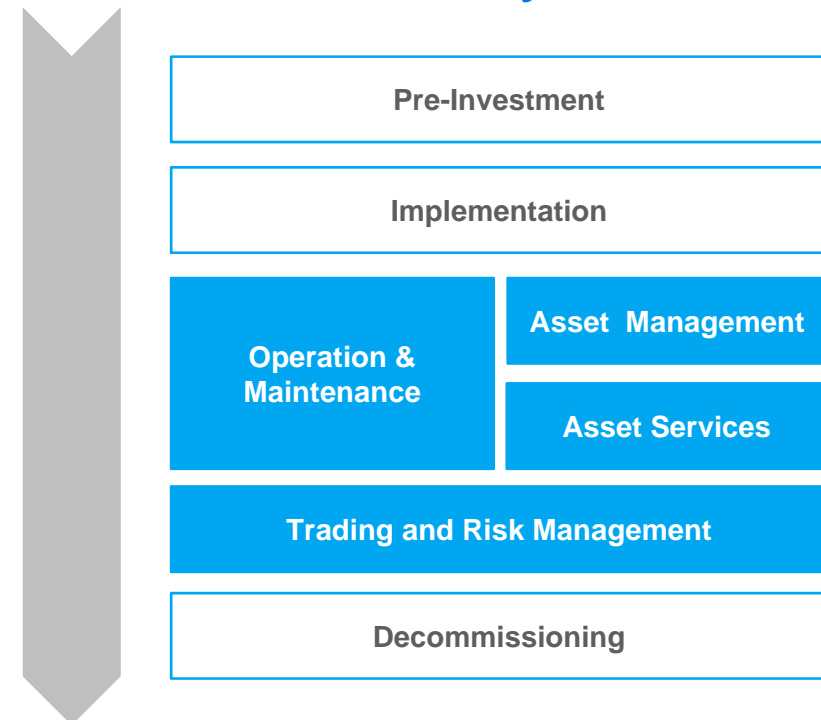
Status of Lead Engine Projects vs Technology Funnel



# 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

## CCGT, Coal, Hydro and Biomass Asset Life Cycle



→ We leverage our “Owners Approach” to deliver Customer Value...



# People matter! Uniper focuses on Talent and Professional Engineering Development

Talent Development



- A move away from classroom teaching
- Focus on coaching - throughout the company
- Reemphasis on line management responsibility for talent development
- Investing in individuals

Professional competence development

## The benefits of professional development to Uniper

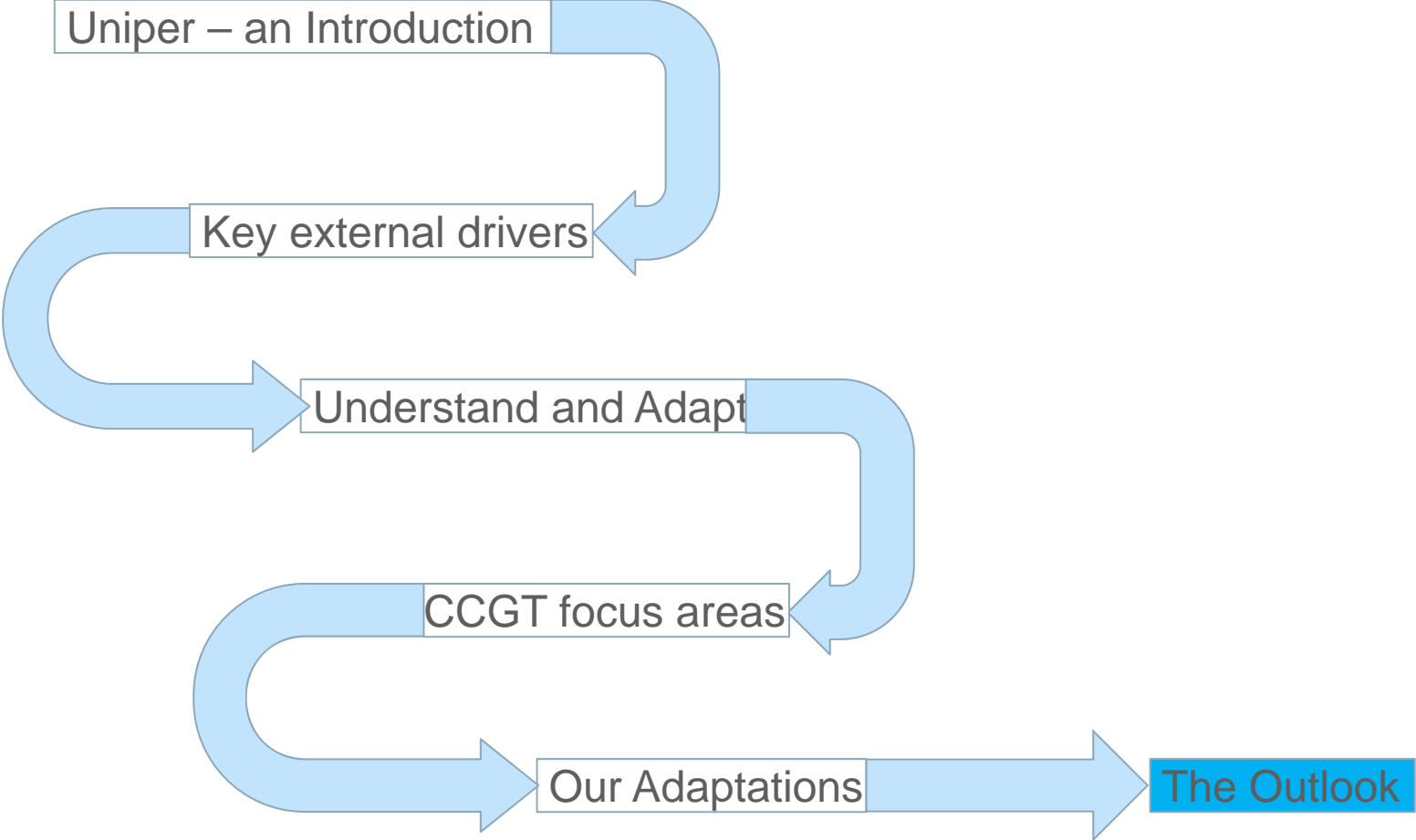
- Demonstrates the quality of our people as well as processes to assure customers of our competence
- Motivates our people, showing that we actively promote and support continuous professional development

## The support provided:

- 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



# 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

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