

A close-up photograph of several turbine blades, likely from a gas turbine engine, arranged in a row. The blades are metallic and have a complex, curved shape. The image is overlaid with a blue and green color filter. A solid red rectangle is located in the top-left corner of the image.

# Flexible back-up: power plants technology for the future energy mix

**Presentation by Dr. Michael Ladwig,  
Vice President of EUTurbines**

**Brussels  
14 April 2015**

## EUTurbines: Who we are

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- Thermal Power Generation based on Gas and Steam Turbines

**ALSTOM**



**SIEMENS**



**DRESSER-RAND**



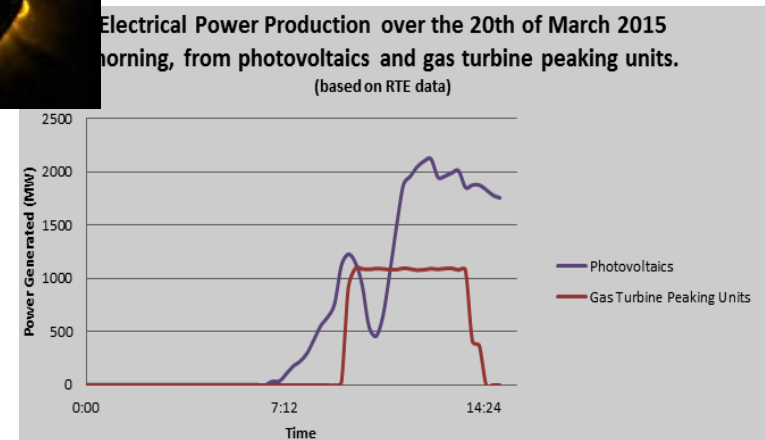
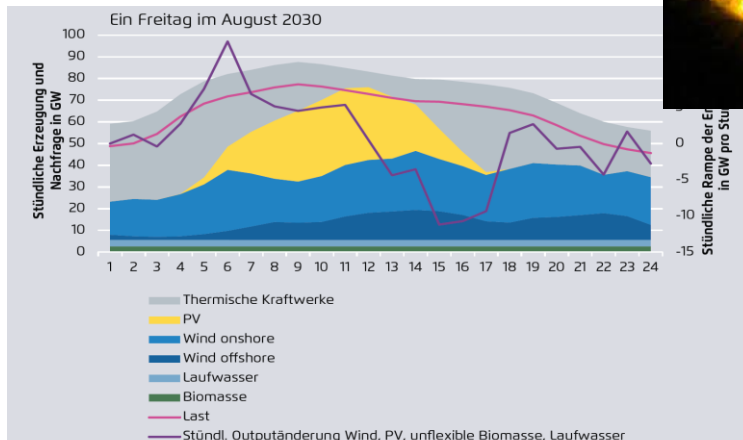
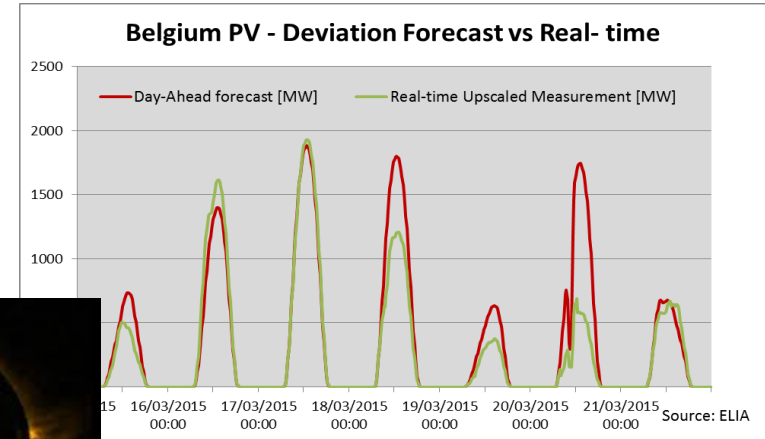
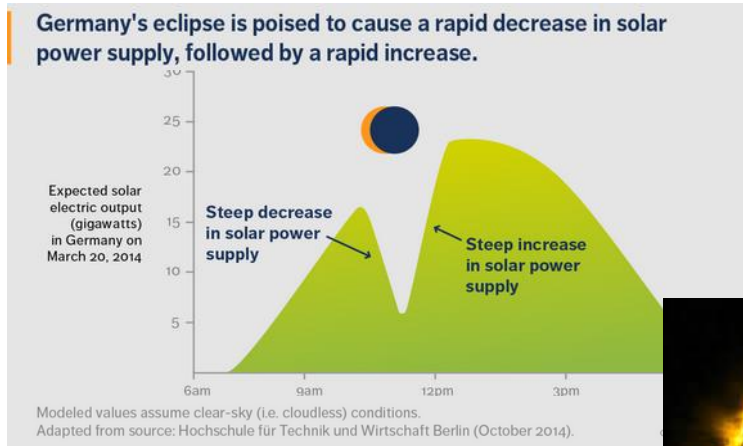
**Rolls-Royce**

**Solar<sup>®</sup> Turbines**  
*A Caterpillar Company*

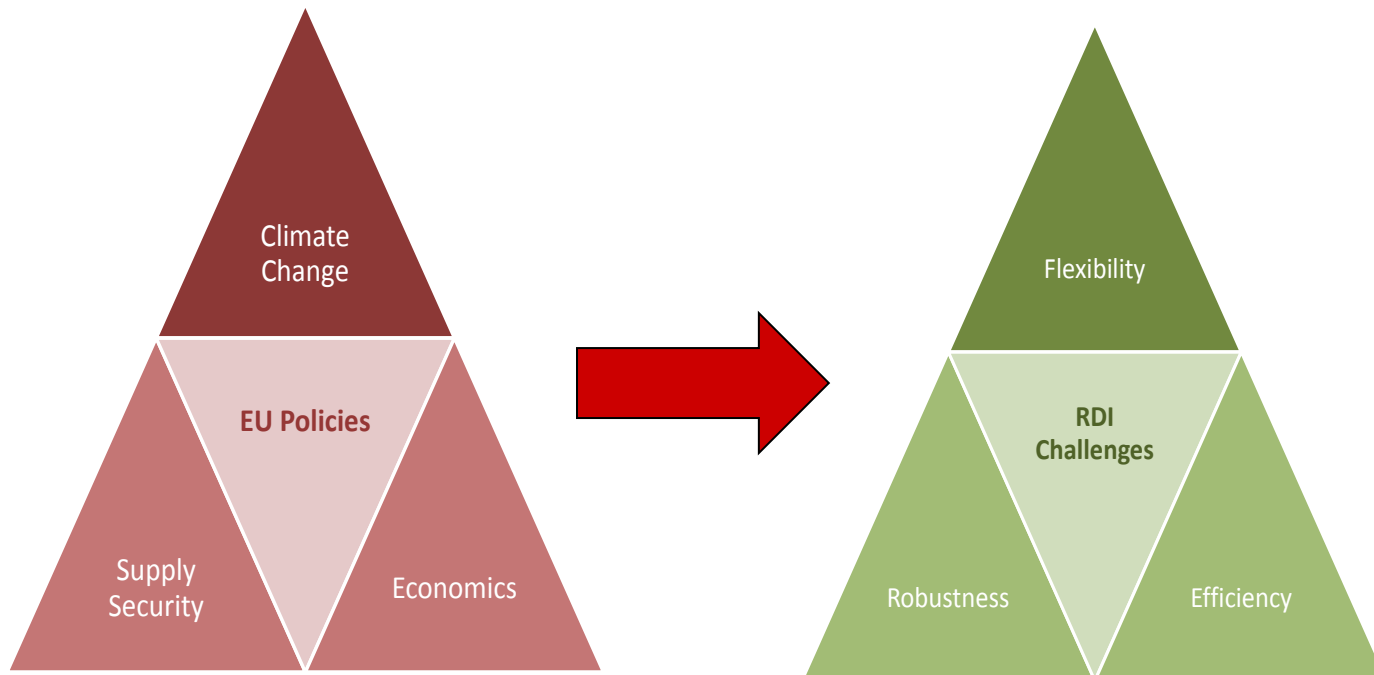
- 70,000 highly qualified employees working in the sector with a business volume of € 25 billion
- More than € 6 billion purchase volume in Europe (mostly to SMEs)

# Steep Ramps and Forecast Errors

## The eclipse as outlook for 2030



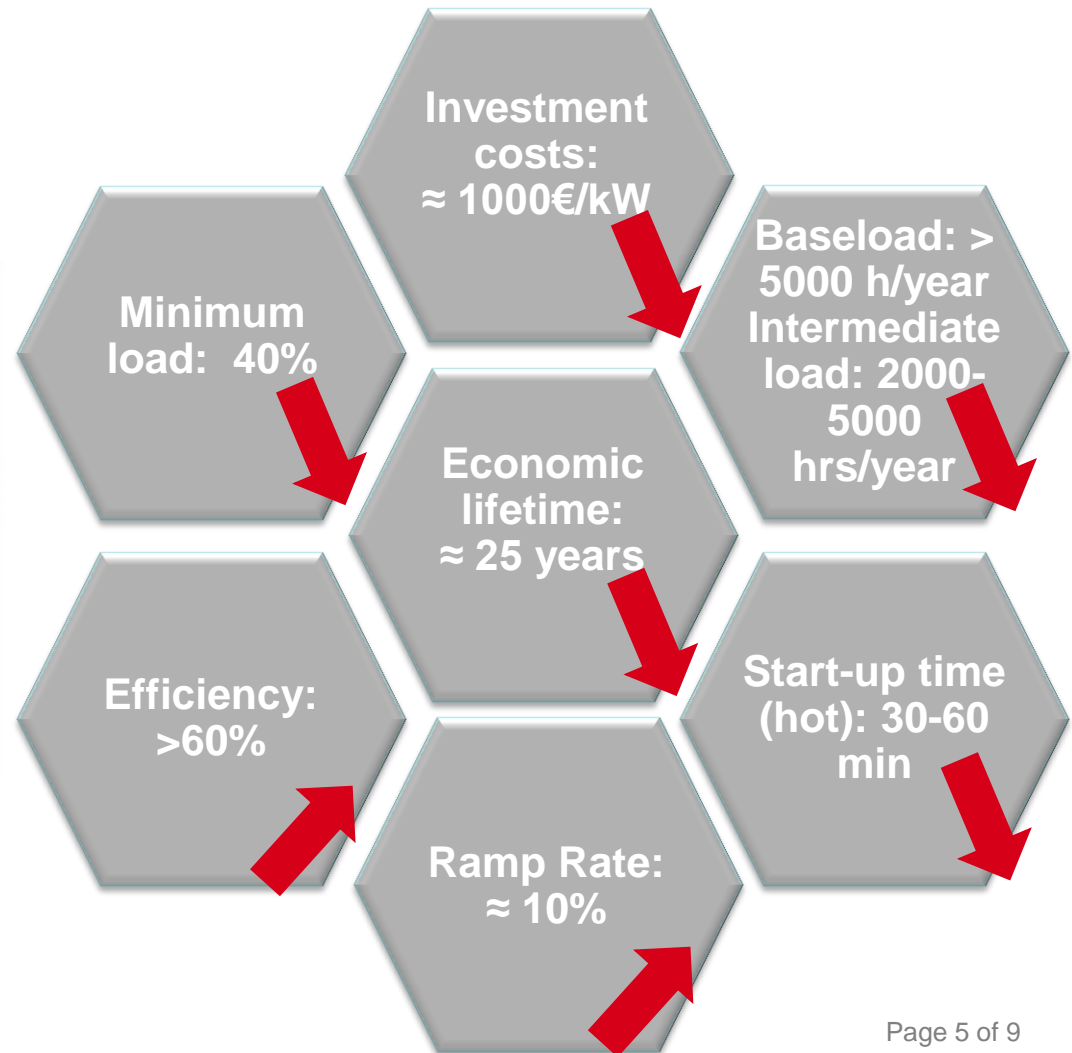
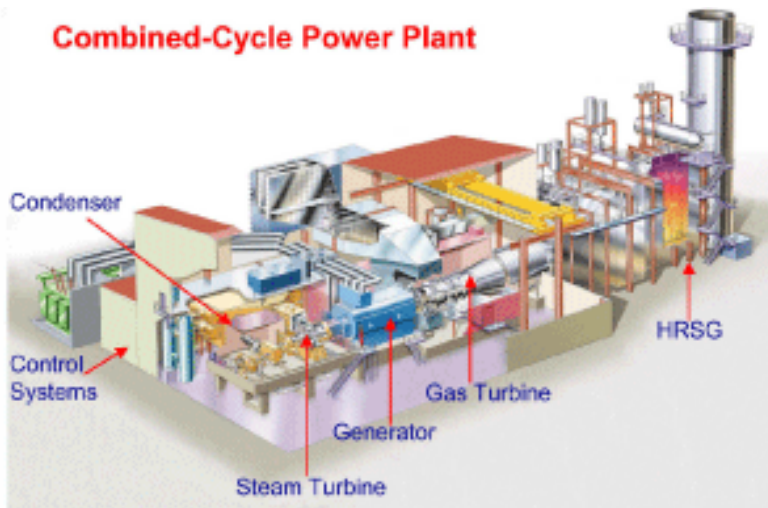
# From EU Policy targets to Thermal Power Technology Challenges



# Thermal power plants – Today and Tomorrow

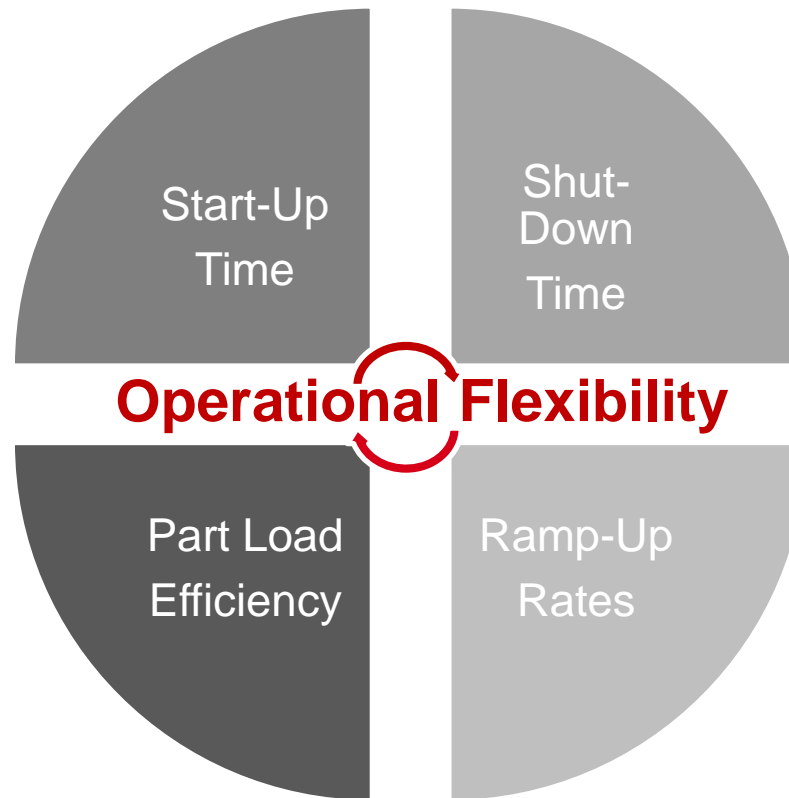
## Typical Combined-Cycle Gas Plant

**Combined-Cycle Power Plant**



# Innovation Areas: Operational Flexibility

## Better matching the new Demand Cycles





## Innovation areas: Application & Design



- Alternative use of Energy
- Fuel Flexibility
- Decentralisation
- Wear & Tear Effects
- Cost Reduction

## Policy Measures – What is needed?



- Consistent environmental legislation and targets
- Electricity Market Design & ETS:  
Incentives to attract investments in new flexible back-up generation
- European R&D funding:  
Adequate co-funding to develop the new flexible back-up capabilities of thermal power plants



**Thank you for your attention!**