



# VPC Corporate Presentation

21/22. 09. 2016



# Agenda



About VPC

Services Portfolio

Experience & Customers

# VPC – Profil

## Shareholder

palero

## Range of services

Engineering services for power generation plants and distribution systems

## Sales

46.6 million euros\*

## Workforce

1,040

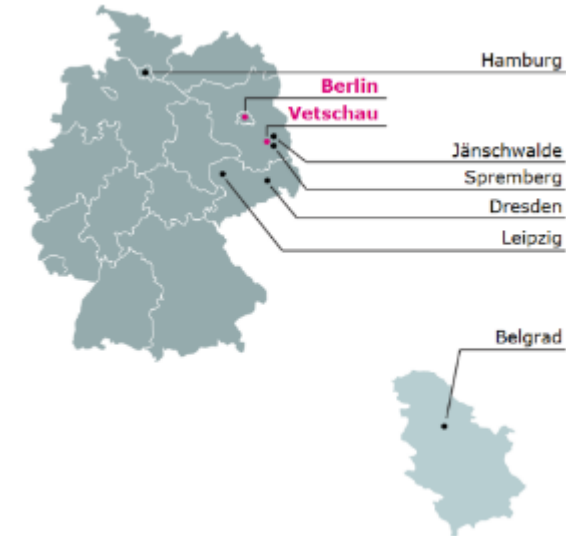
## Subsidiaries

- Lausitzer Analytik GmbH (approx. 100 employees)
- VPC East d.o.o., Serbia (approx. 15 staff)
- Encotec Energy (India) Pvt. Ltd. (approx. 700 employees)

## Certified to

ISO 9001, ISO 14001, OHSAS 18001, KTA 1401, SCC, DAkkS Accreditation

## Locations



\* as at 31<sup>st</sup> December 2016

# VPC's Shareholder – palero capital

palero invest S.á r.l. is an independent private equity company, registered in Luxembourg and managed by palero capital GmbH based in Munich.

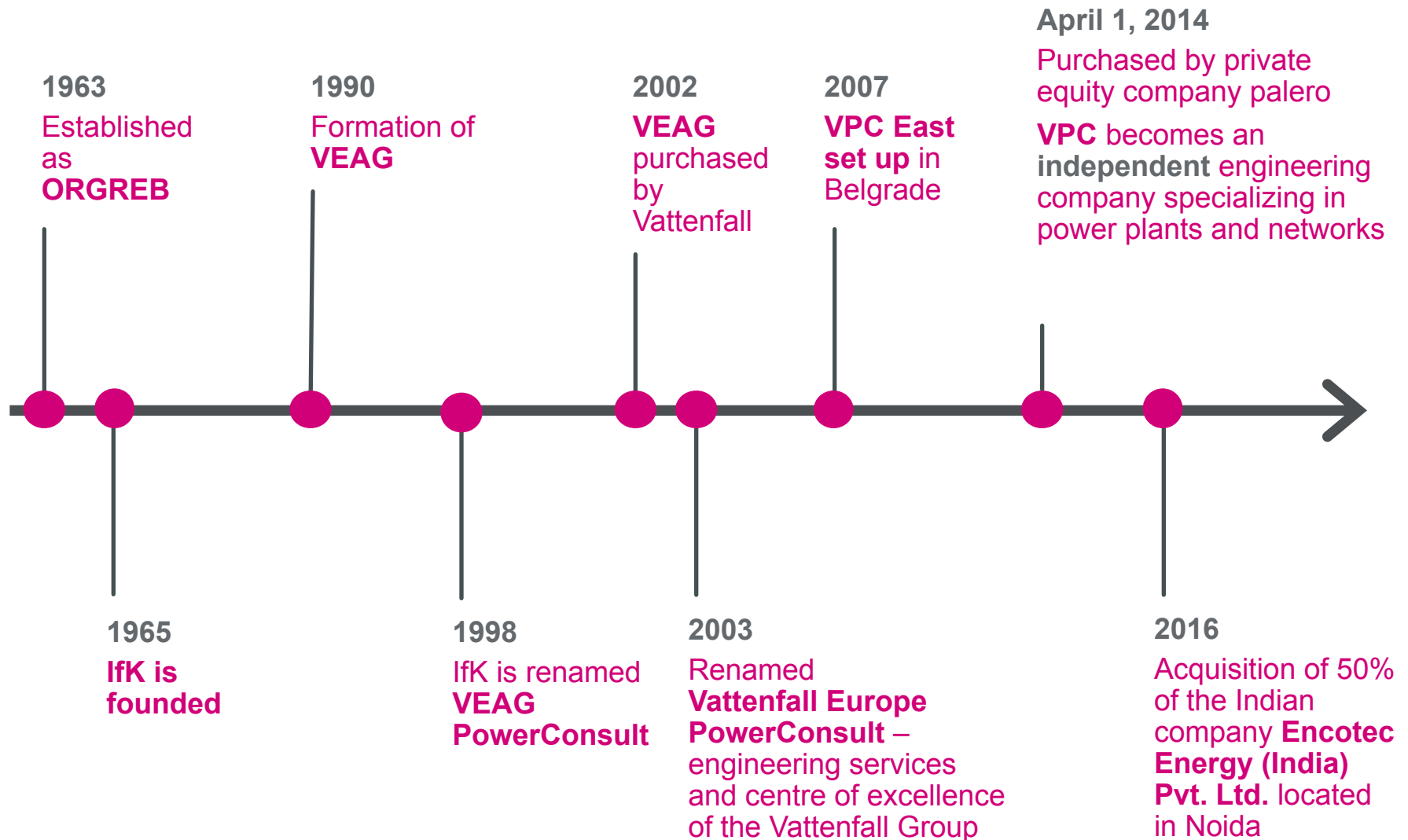
Pursuing a sustainable approach to managing its investment portfolio, palero focuses on the operative development of the operations of the companies.

## Current shareholdings of palero:

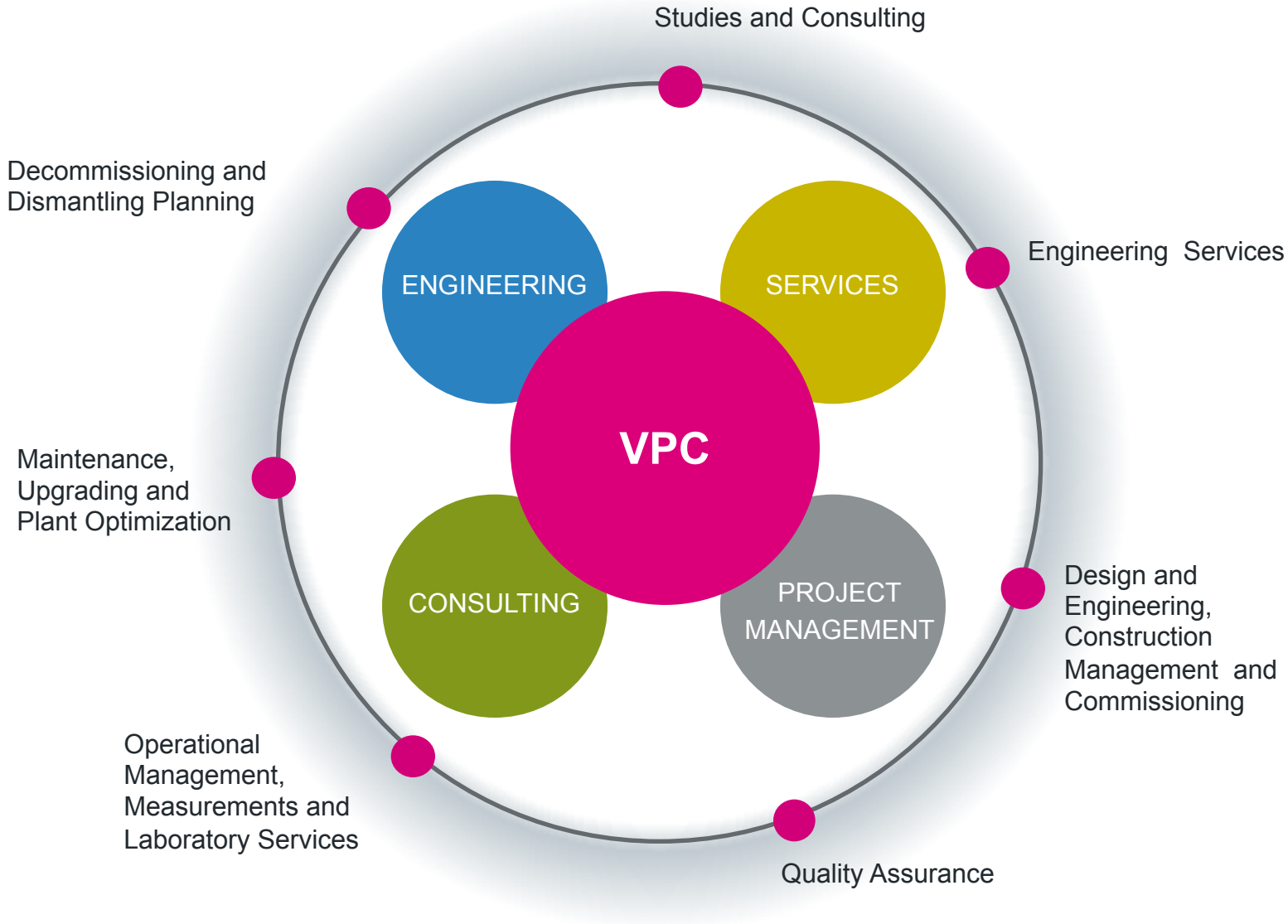
## Year of acquisition:

• Hakle GmbH	Household and sanitary paper	2013
• <b>VPC Group</b>	<b>Engineering services</b>	<b>2014</b>
• Krähe-Versand GmbH & Co.KG	Workwear	2015
• Felina Group	Lingerie	2015
• EVANTEC GmbH	Technical services (in the nuclear field)	2015
• Gallhöfer	Roofing supply	2016

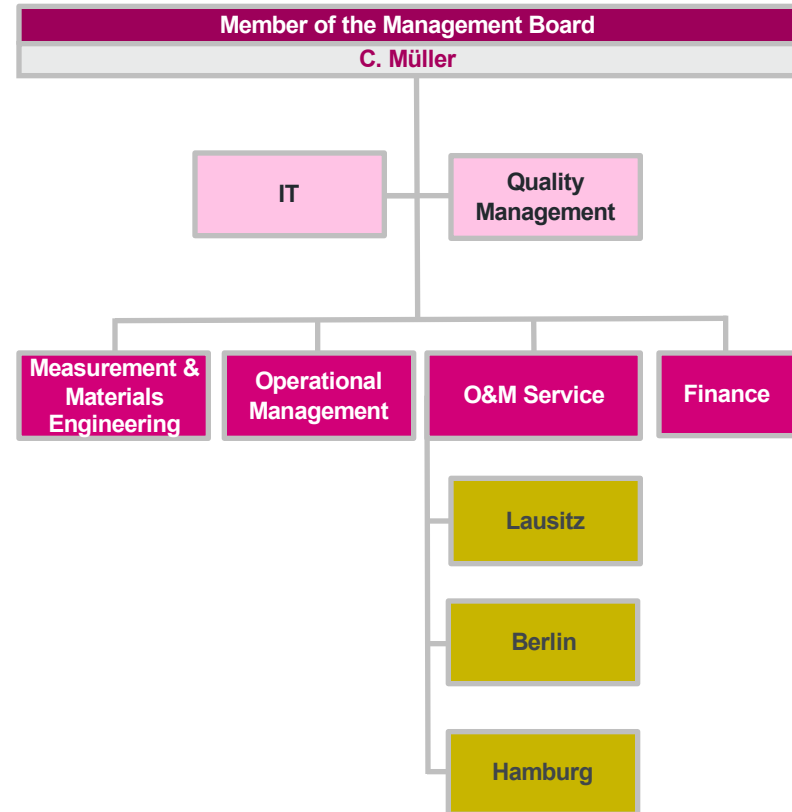
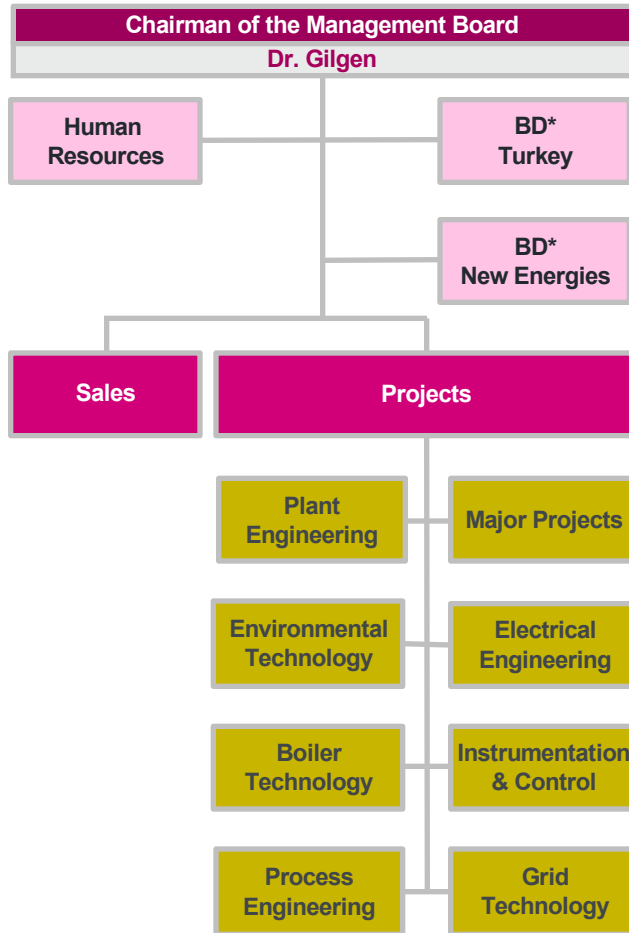
# VPC – History



# VPC – Services Portfolio



# VPC – Organization Geared to Market Requirements



Subsidiaries
• Lausitzer Analytik GmbH (100 %)
• VPC East do.o., Serbien (100 %)
• Encotec Energy (India) Pvt. Ltd. (50 %)

\*BD = business development

# Agenda

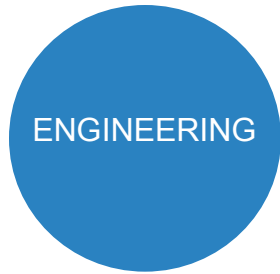


About VPC

Services Portfolio

Experience & Customers





## Plant Engineering

- Studies/concepts
- Basic engineering and detail engineering for new build and modification projects
  - Layout planning/piping engineering
  - Functional engineering
  - Turnkey plant modification projects

## Plant Optimization

- Lifetime extension/flexibilization
- Optimization of load ramps, minimum load reduction
- Process optimization

## Electrical and I&C Engineering

- Studies/concepts
- Engineering for new build projects
- Upgrading and optimization of plants
- Provision of electrical components

## Electrical Grids & Networks

(everything from ultra-high voltage transmission grids to distribution networks)

- Grid calculations/simulations



## Operational management

- Hazard assessments and safety management
- Environmental protection management
- Permitting and approval procedures
- Engineering services for dismantling/ rehabilitation of obsolete plants
- Technical O&M management systems
- Document management

## Measurement and Materials Engineering

### Technical measurements

- Energy measurements on plants, energy studies
- Process quality monitoring
- Combustion analysis
- Emissions /immission measurements
- Model calculations/diagnostics
- Condition inspection/measurement on wind turbine rotor blades

### Materials Engineering

- Destructive and non-destructive testing as part of maintenance measures on site and in the laboratory for damage assessment and lifetime monitoring
- Materials - Technical Consultancy and reports
- Quality assurance

# VPC – Project Management



## Management of major projects

- Project management
- Permit planning/application documentation
- Claim and cost management
- Scheduling and controlling

## Interface management

- Coordination of the different trades and work packages

## Quality assurance

## Site management and commissioning supervision





**Management consultancy services, combined with in-depth and broadly based technical and practical experience**

**Assistance in the early phase of your project:**

- Studies and market research
- Technology selection
- Technical and economic feasibility
- Due diligence
- Technical advisor in decision making

**Customized solutions for problems, such as:**

- Phase-out operation of plants
  - What is to be done?
- Operational Excellence – Operation and maintenance at minimum cost?

# VPC in the Field of Renewable Energies

## Services for regional energy projects:

- Implementation planning and permit planning
- Due diligence, consultation and support in acquisition processes
- Grid connections
- Supervision of construction work, including site management
- Innovative concepts for significant improvement in return on equity of existing plants
- Innovative concepts for reasonable acquisition of wind farms in Germany
- Development, engineering & permitting of hybrid power plants
- Optimization of operation

## Enhancing the value of and return on wind turbine assets by...

- improving aerodynamic design (e.g.: winglets; boundary layer removal)
- blade angle measurements, correction and wind measurement in front of the hub
- optimization of operational monitoring by means of "dynamic" target-performance comparisons
- subsequent raising of hub height
- optimization of insurance premiums and insurance cover by application of an innovative blade scanning technique and by overhaul of assets
- optimization of financing on the basis of PPP schemes



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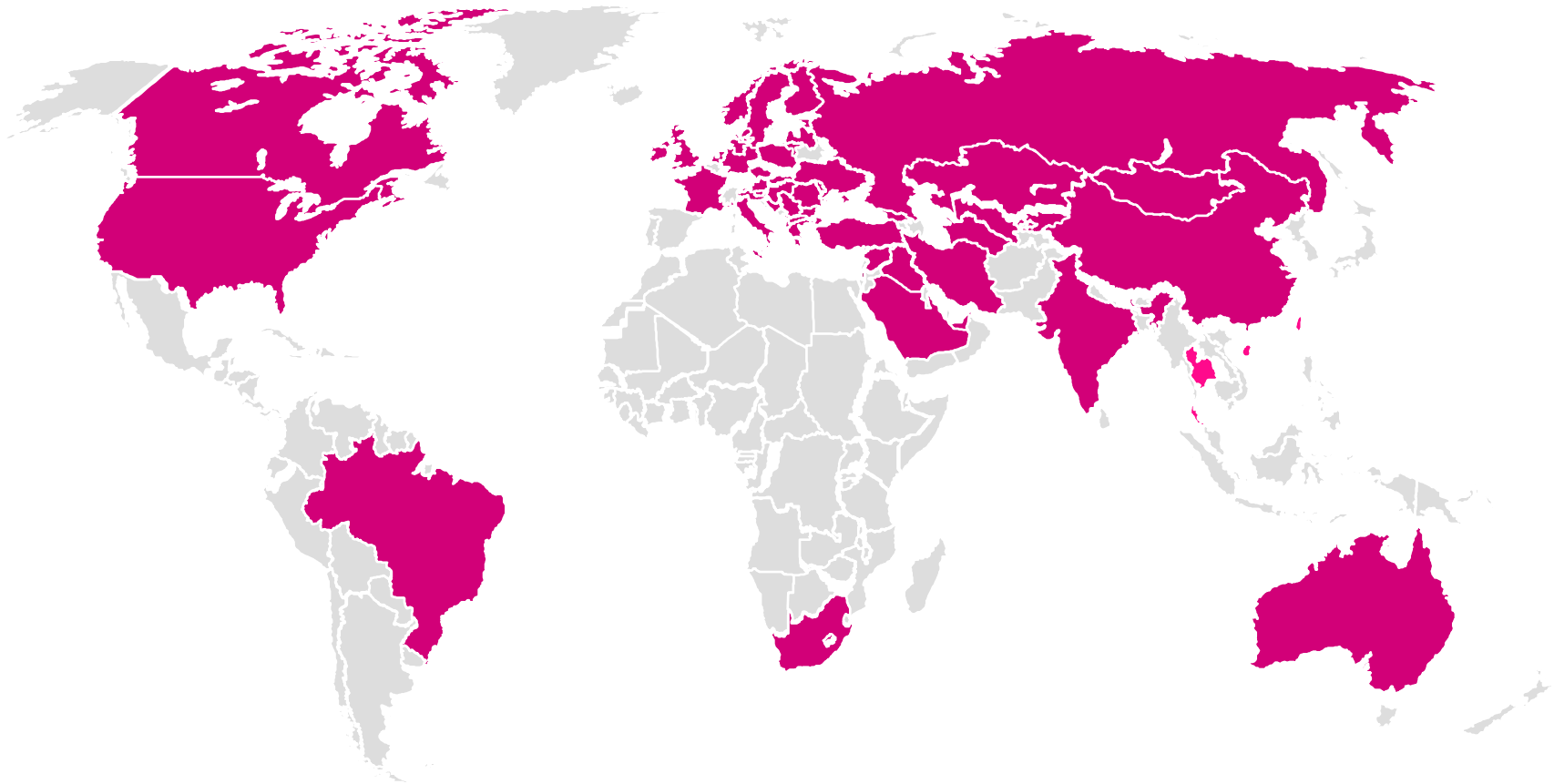


About VPC

Services Portfolio

**Experience & Customers**

# VPC – International Experience



- **Europe:** Albania, Bosnia and Herzegovina, Bulgaria, Czech Republic, Denmark, Estonia, France, Finland, Germany, United Kingdom, Greece, Hungary, Ireland, Italy, Kosovo, Latvia, Lithuania, Moldova, Montenegro, Netherlands, Norway, Poland, Romania, Russia, Serbia, Slovenia, Slovakia, Sweden, Switzerland, Ukraine

- **Far East:** China, India, Laos, Mongolia, Thailand, Taiwan)
- **Middle East and Central Asia:** Georgia, Israel, Iran, Iraq, Kazakhstan, Kyrgyzstan, Saudi Arabia, Syria, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan
- **Australia**
- **Africa:** South Africa, Seychelles
- **Americas:** Brazil, USA, Canada

# VPC – Customers (extract)

## Energy utilities



## Municipal utilities



## Industrial customers



## Development banks





# VPC – Engineering Made in Germany

**VPC – More than 50 years of experience in energy sector projects**

## **Everything from a single source**

From the initial project idea to dismantling:  
Our in-depth engineering services cover the entire life cycle of your project.

## **With the eyes of a plant operator**

Engineering and management based on a thorough understanding of your requirements and concerns as a plant operator.

## **Independent and neutral**

Independent from suppliers and operators  
– **best results for you!**



Boxberg new build power plant, unit R



New build project



... FOR BETTER RESULTS.



# Technical measures for flexibilisation of coal fired power plants

Dr. D. Seibt, W. Apelt, M. Linke

## Objectives

- Increasing of load flexibility to meet the power grid requirements
- Optimize part load operation in order to reduce the costs
- Minimizing increased lifetime consumption and additional maintenance costs

→ Considering the authority regulations (permitted emission limits and plant safety subjects)

## Flexibility potentials

### A) Reduction of minimum load

#### Objectives:

- Expanding load range
- Improving efficiency at low load operations

#### Investigation and evaluation:

- Model-based calculations to identify the bottlenecks of minimum load
- Conducting test runs to improve the combustion process and identify the optimal process parameters

#### Possible technical measures:

- Power plant modifications (retrofit with dried lignite firing system, optimizing of coal mills, integration of heat storage installations)
- Optimization of the I&C-System

## Flexibility potentials

### B) Reducing start-up time compared to design conditions

#### Objectives:

- Minimizing start-up time

#### Investigation and evaluation:

- Investigate the possibilities of increasing temperature gradients based on modified (higher) lifetime consumption

#### Possible technical measures:

- Power plant modifications (integration of gas turbines)
- Increasing cool-down time after shut down (installation of isolating butterfly valves in flue gas and air systems)
- Preservation of a defined temperature level after shut down (external steam, electrical heating)
- Material substitution (modification of wall thickness)
- Increasing flexibility against lifetime consumption without plant modifications (however an intensified monitoring of components is required)
- Optimization of the I&C-System

## Flexibility potentials

### C) Increased load gradients compared to design

#### Objectives:

- Increasing the load change rate

#### Investigation and evaluation:

- Evaluation of the current conditions and identify the improvement potential

#### Possible technical measures:

- Power plant modifications (integration of gas turbines)
- Material substitution (modification of wall thickness)
- Increasing flexibility against lifetime consumption without plant modifications (however an intensified monitoring of components is required)
- Optimization of the I&C-System

## References

- Power plant Moorburg (hard coal, 2x820 MW)
  - reduction of the minimum load to 26 %
  - installation of isolating butterfly valves in flue gas and air systems
- Power plant Jänschwalde (lignite, 6x500 MW)
  - retrofit with dried lignite firing system (including storage and transportation systems)
  - Reduction of the minimum load in duo and mono-operation
- Power plant Lippendorf (lignite, 2x 930 MW)
  - Reduction of the minimum load under warranty the use of steam for district heating