

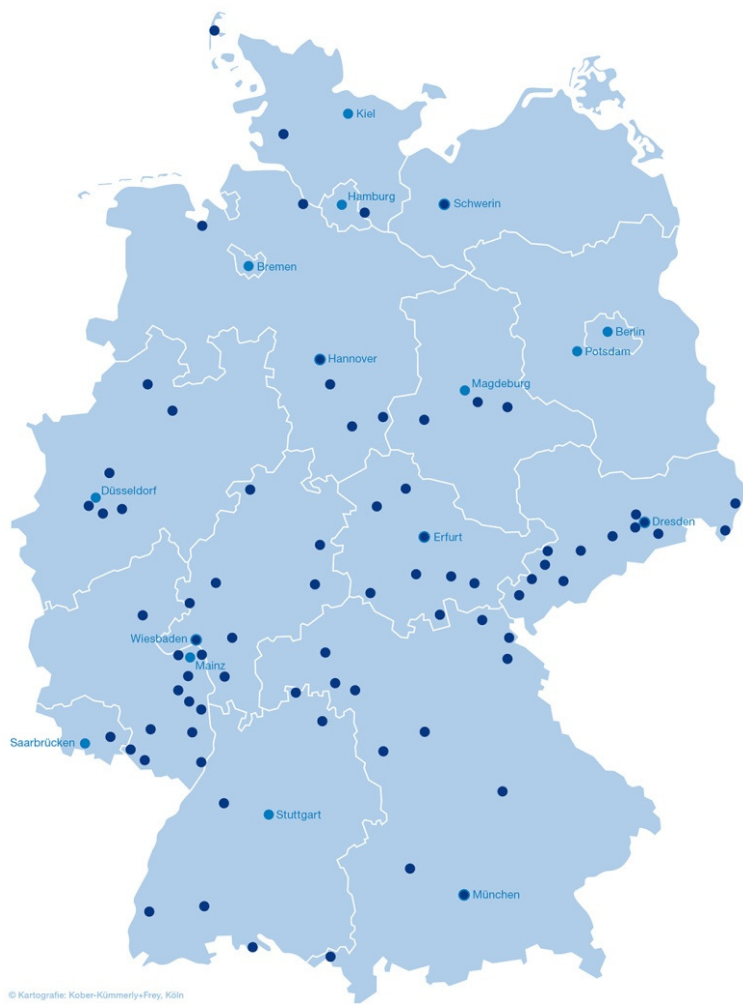
Costs and Benefits Roll-out

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Thüga represents the core of the largest public Energy Network in Germany

Thüga Portfolio



Thüga Business activity

- Shareholdings in approx. 90 public utilities
 - Minority shareholdings with Thüga providing Expert advice
- Value-increasing monitoring through Thüga
 - Transparency with regard to the quality of the capital management and risks
 - Moderation of the cooperation
 - Performing benchmarks
- Direct energy supply
- Shared services

Key figures of the Thüga group

- Sales volume: € 15.3 billion
- Investments: € 2.4 billion
- Gas sales: 123.7 billion kWh
- Electricity sales: 36.6 billion kWh
- Gas customers: 2.2 million
- Electricity customers: 3.1 million
- Employees: 16,800

Costs and Benefits

associated with different market roles

Market Role	
Costs	
<ul style="list-style-type: none">•investments in infrastructure•operation of IT systems•etc.	grid operators
Benefits	
e.g. <ul style="list-style-type: none">•service-oriented/ bundled products	sales and distribution department (S&D)
e.g. <ul style="list-style-type: none">•transparency	customers
Some benefits for S&D need changes referring to market rules.	

As grid operators are strongly affected by regulatory framework conditions, costs for meters with basic functionalities have to be acknowledged by national regulatory authorities.

Roll-out

Referring to a smart meter roll-out solution the following aspects should be considered:

Cost/Benefit Analysis	<ul style="list-style-type: none">• Specific national conditions/ market structures always have to be adequately taken into account.• The focus should be on the most effective extent level of roll-out (electricity/gas)
Influence on Energy Efficiency	<ul style="list-style-type: none">• electricity: achievable, with additional consulting services• gas: uncertain referring to domestic customers
Need for Standards	<ul style="list-style-type: none">• minimum standards prevent misdirected investments
Functionalities of the Meters	<ul style="list-style-type: none">• basic features under regulation (regulated market design)• additional features under competition (competitive market design)