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Documentation of Tender Process and Reasoning for Choice of Supplier

Deliverable D5.4

V1.0

27.10.2017

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ID & Title :	D5.4 Documentation of Tender Process and Reasoning for Supplier		
Version :	V1.0	**Number of pages :**	99
Short Description			
Deliverable 5.4 deals with the procurement process for the Smart Grid Hub to be implemented in Demo 3 in Germany. It gives a brief description of the requirements and specifications of the Smart Grid Hub and outlines the supplier landscape. Furthermore it gives a detailed description of the qualification and evaluation KPI and shows the reasoning for the selection of the supplier.			
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EXECUTIVE SUMMARY

This report documents the reasoning and final decision for the selection of a subcontractor to design and implement the Smart Grid Hub on the premises of Avacon´s grid control center. The subject of the tender process was the Smart Grid Hub, an aggregation and disaggregation platform that enables DSOs to take full advantage of a smart meter infrastructure in private households. The Smart Grid Hub is designed as an on-premise solution within the boundaries of Avacon´s grid control center. Subcontractors looking to submit a bid for the implementation of the SGH would have to demonstrate their capability to program and implement the requested solution according to Avacon´s technical specification.

While the market for aggregation platforms remains very active and dynamic it is less clear which companies can be considered capable to implement the solution in the grid control environment. Even in the age of digitalization and IoT, grid control remains special, especially in Germany where federal laws regarding data security and privacy are of the most restricting kind. To ensure that the subcontractor chosen for the complex task of implementing the Smart Grid Hub in the DSO-environment, Avacon undertook a comprehensive market study and tender process to find the best supplier and maximize value for money.

A total number of 22 potential suppliers were invited to provide detailed information and quotes for the implementation work. Through careful examination of the responses and a following tender process adhering to E.ON´s principles of transparent and non-discriminatory procurement the best suited supplier was eventually chosen and awarded the contract for the implementation.

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1. INTRODUCTION

The Smart Grid Hub (SGH) is part of an integrated concept to enable the grid control center of a DSO to access and directly control small scale flexibilities of any type in response to violations of technical grid constraints or external market signals. Other crucial parts of this concept are the communication infrastructure and smart-meter gateway administration, intelligent (digital) metering devices and control boxes at the customer's premises.

The general protocol for the use cases during the Smart Grid Hub field test phase are as follows:

1. Grid control provides an estimate of the state of the MV- and LV-grid, based on technical data from grid sensors (voltage, current), customer sensors (consumption, feed-in) and external factors like the weather.

2. Based on these state estimates grid control can identify potential imbalances in specific areas of the grid or impeding or existing violations of technical limits like local voltage excess or current overload of assets (grid congestion). To bring the local grid back to a balanced state and / or to relieve local grid congestion a cascade of actions can be taken.

3. In the cascade of action grid control tries to re-balance the grid by altering the current state of operation with switching actions. The second step is to leverage local flexibility in order to relieve congestion and to return to a balanced state. If both these strategies fail, a more heavy-handed approach of grid safety measures has to be taken.

4. The SGH monitors the current status and availability of all sources of flexibility at all times.

5. If necessary grid control can request a certain amount of power ramp up or ramp down in a specific area of the grid. The SGH will then determine the optimal strategy to deliver these actions while keeping total intervention at a minimum and send control commands to achieve the desired outcome.

At its core the SGH is a control solution in the environment of intelligent metering systems. The SGH accepts control requests, processes data from sensors and metering devices, analyses data, determines the optimal set of action to achieve the desired outcome and finally sends control signals to the flexibility source at the customer's premises.

For the German Demo in Interflex Avacon seeks to employ a subcontractor to support with designing and implementing the Smart Grid Hub. There are several reasons why Avacon made the decision to handle the implementation with the external help of subcontractors. For once, Avacon herself as a distribution system operator does not have the capabilities and resources to handle the programming and IT-implementation of such a complex system. Furthermore the landscape of potential suppliers at the moment appears confusing and unclear, which is why Avacon decided to make a comprehensive market research and tender process part of the project. This way Avacon seeks to minimize the costs for the implementation of such a solution while creating knowledge for partners and the EC about the current state of potential suppliers for flexibility solutions in general.

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1.1. Scope of the document

This document provides an overview over the supplier landscape and procurement strategy for the implementation of the Smart Grid Hub as a key element to the German Demo in Interflex. It takes the reader through market research, the entire tender process and highlights the reasoning for Avacon's final decision for contract award.

1.2. Notations, abbreviations and acronyms

The table below provides an overview of the notations, abbreviations and acronyms used in the document.

DSO	Distribution System Operator
SaaS	Software as a Service
SCADA	Supervisory control and data acquisiton
SGH	Smart Grid Hub
RFI	Request for information
RFQ	Request for quotation

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2. REQUIREMENTS AND SPECIFICATIONS OF THE SMART GRID HUB

The Smart Grid Hub is conceptualized as an additional processing and data unit that enables today's grid control center to take full advantage of a widespread deployment of digital power metering devices in private households. The SCADA system which is in use today is designed for a relatively small number of elements and has limited data processing capabilities. It is not designed to collect, store, analyse and process large amounts of data from a residential smart meter infrastructure, nor does it have the capability to employ algorithms to control a large number of small elements of flexibility.

The Smart Grid Hub is designed as a data aggregation unit that handles all the incoming data from residential smart meters. Its purpose is to collect these treasures of data, store it in a data base, analyse, condense and prepare data for further use in grid operation. Furthermore it is designed to disaggregate flexibility requests from grid control into a set of individual commands for the connected elements of flexibility.

2.1. Technical Specifications

For details of the technical specification please refer to Deliverable D5.3 in Annex 1.

2.2. Project specific challenges

The Smart Grid Hub is designed as an on-premise solution located within the grid control center of Avacon. It is designed to run on Avacon-owned and operated servers in the grid control environment and behind the grid control firewalls. As such, the Smart Grid Hub itself has to comply with security, reliability and availability standards that are best practice in grid operation. These comparably high standards are also reflected in the requirements for fault response and support.

Furthermore the supplier will have to implement the solution on-premise. Access rights to the grid control center are being handled very restrictively and subcontractors have to be ISO 27001 certified in order to qualify for access rights to the location of the grid control center. Beyond physical access there are only limited options for remote access to the servers at Avacon. Since the grid control environment is secured by firewalls, all remote access has to go through a demilitarized zone. Accordingly, a greater than normal amount of the implementation work will have to be carried out on premise.

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3. SUPPLIER LANDSCAPE

The project team has built the procurement strategy based on a comprehensive market study of potential contractors. As part of the preparations for the tender for the Smart Grid Hub the project team undertook an analysis of the supplier landscape in the form of an official "request for information" (RFI) in accordance with E.ON´s supply chain guideline 3-28 (Annex 2).

3.1. General overview of potential supplier

A team consisting of experts in grid operation and business IT scanned the market for potential suppliers. For the resulting long list of suppliers the team did extensive market research to identify the most suitable companies and subcontractors. Companies were selected based on their general product and service portfolio, their reputation and reference projects. The result was a list of 22 suppliers. These 22 suppliers were provided with a brief description of the envisioned project and technical concept and were invited to answer an extensive list of questions. Of all 22 suppliers 1 was turned down by Avacon based on the outcome of the question catalogue, 11 companies declined the invitation to quote for the RFI themselves. The final long list of suppliers consisted of 10 companies who accepted the invitation and gave satisfactory replies to the initial interview. An overview over all the companies and their status after the invitation to the RFI is shown in Table 1 below.

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Table 1 List of potential suppliers before RFI

Company	Not invited	Invitation declined by supplier	RFI completed
SAP	X		
Ventyx		X	
ABB		X	
Trimble (Tekla)		X	
Robotron		X	
Schneider Electric		X	
General Electric		X	
Capgemini		X	
ITF – EDV Fröschl		X	
Oracle Utilities		X	
Iltron		X	
Seeburger		X	
Bosch			X
IBM			X
IBM / Alliander			X
Elster			X
Landis & Gyr			X
SAG			X
Siemens			X
PSI			X
BTC			X
Next Level Integration			X

3.1.1. Results from RFI

For the RFI potential suppliers were provided with more detailed technical specifications. The evaluation of responses was standardized across all bidders and divided into a technical and commercial evaluation. For the technical part the evaluation team utilized a catalogue of 120 detailed questions, each of which would have been assessed individually and assigned a value of 0 – 10. This point system would later translate into a % of technical suitability. The complete list of criteria can be found in Annex 3. The goal was to narrow down the long list further to a short list for a later request for quotation and invitation to tender.

On the commercial side the bidders were requested to provide a price estimate for the implementation of a solution according to the technical specifications. These estimates were to be differentiated for implementation and the cost for operation and maintenance. Furthermore suppliers were invited to offer estimates for on-premise installations and SaaS solutions.

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3.1.2. Technical evaluation

For the technical evaluation the list of criteria was divided into five groups.

1. General assumptions
    a. Respecting legal guidelines
    b. Investment protection
    c. System performance
    d. Reliability and availability
    e. Scalability and usability
2. Interfaces
    a. Integration layering
    b. Grid control interface
    c. Protocol support
3. IT-Architecture
    a. Authorization
    b. Functions
    c. Grouping
    d. Monitoring
    e. Data base functions
    f. Archiving
4. Operation
    a. Infrastructure
    b. Maintenance and support services
    c. User management
    d. Application lifecycle management
5. Data privacy and security
    a. Compliance with legal and corporate requirements

For a detailed presentation of all questions and criteria please refer to Annex 3.

Each supplier would be awarded a number of points based on marks for each criterion and each question on a scale of 1 - 6[1] according to the key shown in Table 2 below

Table 2 Grading system to evaluate KPI performance of potential contractors

Grade	Points	Requirement
1	10	All demands are met without constraints
2	8	Demands are met with minimal constraints and / or negligible modification of performance
3	6	Demands are met with constraints and / or modification of performance and function
4	4	Demands are met only with severe constraints and / or extensive modifications of performance and function
5	2	Demands are met only with severe constraints and / or critical modifications of performance and functions
6	0	Demands are not met at all

[1] The scale from 1 – 6 reflects the German school marks system, where 1 = excellent, 2 = good, 3 = satisfactory, 4 = sufficient, 5 = poor, 6 = unsatisfactory

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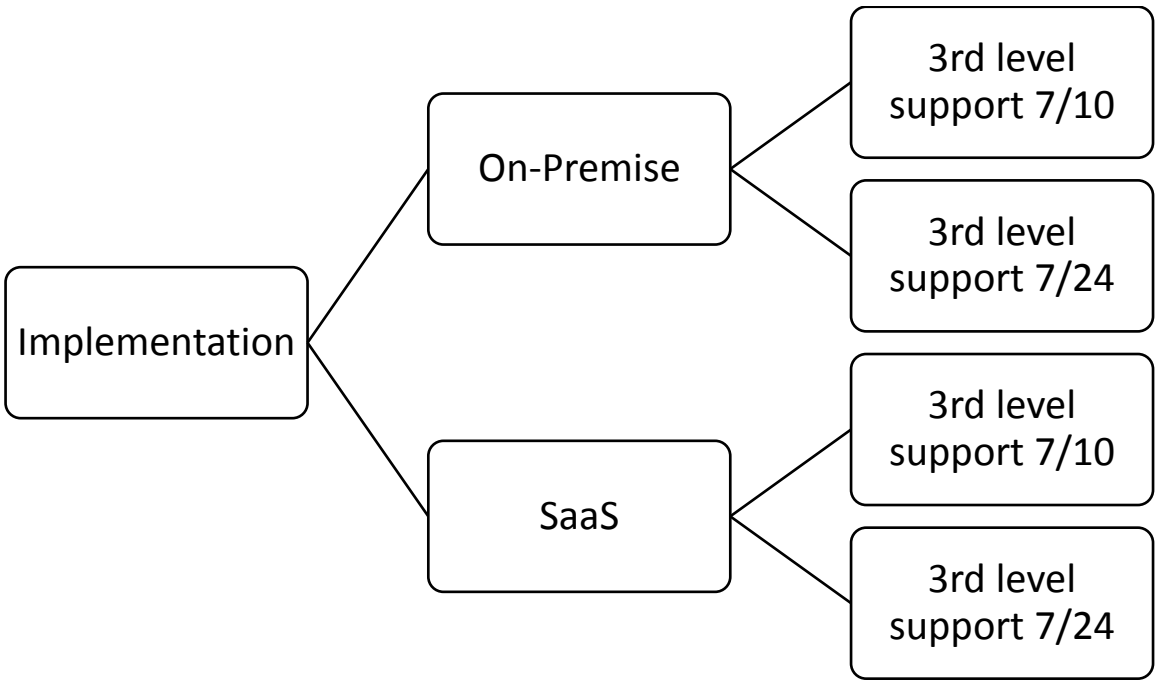
3.1.3. Commercial Evaluation

Suppliers were asked to provide price indications for 4 different scenarios as shown in Figure 1.

Figure 1 Service scenarios for the Smart Grid Hub



Based on the technical specifications the project further specified the scope of the offer. On-premise offers had to include

1. Productive system with redundant database-, web- and application servers
2. A second redundant productive system as fall back solution
3. A test- and development system
4. An additional project system

Table 3 below shows the different scenarios suppliers offered.

Table 3 Scope of individual offers

Supplier	SaaS	On-premise	3rd level 7/10	3rd level 7/24
Bosch	X	X	(X)	X
IBM	X		X	X
IBM / Alliander	X		X	X
Elster	X	X	X	X
Landis & Gyr		X	X	X
SAG		X	X	X
Siemens		X	X	X
PSI		X	X	X
BTC	X	X	X	X
Next Level Integration	X	X	X	X

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Table 4 shows the minimum, maximum and average price of all replies that were submitted to the RFI.

Table 4 Price indications based on the 2015 request for information

	3rd level support 7/10	3rd level support 7/24
Minimum	2.896.000	2.896.000
Average	7.160.121	8.092.789
Maximum	13.299.000	13.674.000

3.1.4. Ranking of suppliers and initial short listing

The aim of the RFI was to narrow down the number of potential suppliers based on technical capabilities, quality of service and commercial competitiveness. Following the technical evaluation laid out in chapter 3.1.2 (see p.6) 7 suppliers were chosen for further evaluation and as candidates for a future tender. 3 suppliers were below threshold and hence not recommended for further collaboration on this project. Table 5 shows the detailed results of the technical evaluation.

Table 5 Technical evaluation of RFI responses

Supplier	Total Score	General Assumptions (20%)	Interfaces (20%)	IT-Architecture (20%)	Data privacy (20%)	Operation (20%)
BTC	86%	86%	84%	84%	92%	88%
Elster	78%	82%	81%	82%	67%	78%
Next Level Integration	77%	87%	52%	82%	89%	79%
Landis & Gyr	74%	81%	74%	70%	80%	70%
PSI	73%	77%	77%	70%	64%	77%
Siemens	72%	80%	63%	70%	69%	70%
Bosch	64%	64%	59%	65%	69%	68%
Below threshold / dispqualified						
IBM / Alliander	66%	67%	55%	74%	88%	66%
SAG	62%	63%	69%	65%	70%	45%
IBM	58%	48%	36%	51%	95%	63%

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4. TENDER STRATEGY AND DOCUMENTS

For the German Demo in Interflex the tender followed up on the initial RFI laid out in the chapter before. After further consideration the short list of potential suppliers was extended to two more companies which had shown excellent reference projects in the meantime.

4.1. Procurement guidelines

Avacon is committed to a fully transparent and fair procurement process. This commitment is deeply rooted in the organization and laid out in detail in the Group Policy GP 3 – 28 Supply Chain (for the full document please refer to Annex 2). Objective of this supply chain process to ensure that the principles of fairness and competition are being adhered to at all times. This means that

- E.ON / Avacon staff will always act according to E.ON´s Code of Conduct and to the applying Group Policies
- All suppliers will be treated on an equal basis
- Suppliers will be selected on a rationale, transparent and consistent basis

To ensure a maximum of transparency and rationality the tender process for the Smart Grid Hub has been lead in accordance with E.ON´s Group Policy.

4.2. Tender for the implementation of the Smart Grid Hub

Based on the outcome of the earlier request for information process a total of 7 companies were invited to tender for the implementation of the Smart Grid Hub. These companies were

1. EFR
2. SAG / Dr. Neuhaus
3. Siemens
4. PPC
5. Landis & Gyr
6. Next Level Integration
7. PSI

4.2.1. Scope of Work

The scope of the tender included individual modifications of the application platform for the Smart Grid Hub according to the technical specifications which have been described in Deliverable D5.3 (for details please refer to Annex 1). The subcontractor would be requested to offer the implementation of a grid control solution on Avacon´s premises in Salzgitter and to handle the project management for the creation, modification and implementation of the SGH. Furthermore the contractor would be required to coordinate the creation of interfaces with suppliers of adjacent systems (grid control and control box head-end-system) and offer operation and maintenance of the requested solution for the duration of the project.

The offer would have to include all costs and services for the successful implementation and operation of the SGH in time and with respect to the remaining milestones of the project. To account for the innovative and progressive nature of the project contractors

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were asked to include a sufficient amount of time for modifications and adaptations over the entire phase of the project so that key learnings could be put to action right away.

4.3. Responses to tender

All 7 suppliers initially accepted the invitation to tender and signed the non-disclosure agreement that was requested as a prerequisite for tender participation. Unfortunately and much to Avacon´s surprise only two suppliers submitted valid offers. Two contractors rescinded their announced interest quoting the tight timeline as a reason. The remaining three contractors gave no explanation for their lack of submitting an offer.

Eventually Avacon was presented with an offer from PSI and EFR, both of which would have to be evaluated in accordance with EON´s procurement guidelines to ensure a maximum of transparency, fairness and to minimize the cost incurred during the project phase.

4.3.1. Evaluation of responses to tender

Both bidders were offered workshops to clarify questions regarding the technology and scope of work. Additionally the legal framework and contract was negotiated with each party, based on the same contract template. Legal aspects were crucial, particularly to make sure that the contractor would honour the data privacy and security requirements and to ensure a management of right of intellectual property so that Avacon would be able to honour her obligations to share and disseminate the results of the project.

In order to proceed in the most objective and transparent way the offers of both bidders would be evaluated on the basis of an evaluation matrix. The evaluation criteria covered four main areas

1. Commercial aspects
2. Legal aspects
3. Data privacy and security
4. Technical aspects

For those topics experts would assign marks for a number of criteria in each category and according to these evaluations the contractor would be chosen.

Table 6 below shows the evaluation criteria as applicable for the implementation of the Smart Grid Hub at Avacon for the purpose of Interflex Demo 3. The complete matrix including the weighting of each criterion can be found in Annex 4.

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Table 6 Tender evaluation matrix

Commercial Aspects		
	Liability, warranty	
	Additional services	
	Cancellation policy	
	Price implementation works	
	Price operation and maintenance	
Operation and maintenance services		
	Contract design	- General structure of contract is accepted - Supplier´s terms and conditions are not part of the contract
	Rights of Use	- Application platform - Databases - Documentation - Training resources - Results of work - Updates, patches
	Subcontractors, nondisclosure, confidentiality	- Contractor accepts all conditions
Secondary Claims		
	Contractual secondary claims	- Penalties
	Third party IP	
	Other	- Change requests - Obligations to co-operate - Final provisions
Data privacy		
	TOM	- in line with Avacons standards and §9 Bundesdatenschutzgesetz (Federal Law for Data Privacy)
	Liability for violations of data privacy	
	Data privacy related contractual penalties	
	Right to audit	
Technical Aspects		

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	Process Incident Management	
	Process Problem Management	
	Process Change Management	
	Process Service Level Management	
	Process Configuration Management	
	Optional modules	
	Project timeline	
	User Interface	
	Operations	
	Upgrades	

4.4. Final verdict and contract award

Based on the outcomes of technical and legal workshops and each contractor´s response to the tender the project team assessed each bid individually with the help of the evaluation matrix shown in 4.3.1. The result of this evaluation was that bidder EFR made the most competitive and technically most suitable offer. On a scale of 1 – 6, where 1 = excellent and 6 = unsatisfactory, EFR scored a total of 1.45 compared to a 3.12 of competitor PSI. The bid of EFR was particularly competitive in commercial aspects where it scored 1.00 versus 3.5. EFR was also offering the most preferable legal conditions (1.35 versus 1.70) and lead in the technical evaluation as well (2.10 versus 2.84). Since both parties accepted the legal and corporate requirements for data security and privacy without limitation there was no differentiation between the two under these aspects. Please refer to Annex 4 for the final detailed evaluation matrix.

Based on the outcomes of the tender EFR will be awarded the contract to implement the Smart Grid Hub at Avacon´s premises beginning in November 2017.

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5. APPENDICES

5.1. Annex 1 – Technical Specifications of the Smart Grid Hub

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Documentation of Specifications of the Smart Grid Hub

Deliverable D5.3
Demo

31 / 05 / 2017

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ID & Title :	D5.3 Documentation of Specifications of the Smart Grid Hub		
Version :	V3	**Number of pages :**	25
Short Description			
At the heart of the German Demo lies the Smart Grid Hub, an extension of the Grid Control Center of the DSO. The Smart Grid Hub monitors and controls small scale flexibilities in the distribution grid in order to ensure safe and reliable grid operation under any circumstance.			
Revision history			
Version	**Date**	**Modifications' nature**	**Author**
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V2	29/05/2017	Reviewed version	Thomas Drizard
V3	30/05/2017	Final version ready for submission	Thorsten Gross
Accessibility			
☒Public	☐ Consortium + EC	☐ Restricted to a specific group + EC	☐ Confidential + EC
If restricted, please specify here the group			
Owner/Main responsible			
Name(s)	**Function**	**Company**	**Visa**
Thorsten Gross	WPL WP5	Avacon	
Author(s)/contributor(s) : company name(s)			
Avacon			
Reviewer(s) : company name(s)			
Company		**Visa**	
Enedis			
Approver(s) : company name(s)			
Company		**Visa**	
Work Package ID	WP 5	**Task ID**	T5.8.1

EXECUTIVE SUMMARY

With the ongoing change of European energy systems towards a more sustainable generation of power we are faced with numerous challenges. One of these challenges is to keep the power grid stable and reliable at all times. With a growing share of fluctuating power generators it will become increasingly more difficult to achieve the necessary balance between generation and demand at all times.

InterFlex seeks to find solutions to these and other questions presented to us by the European transition towards a greener future. To achieve the delicate balance between generation and demand the system has to become smarter, more interconnected and much more capable at acquiring and processing local field data. Under the guidance of Avacon the German Demo of InterFlex aims at bringing the grid control center of a rural distribution system operator to the next level. We envision a future grid control center that is capable of making the best use of a vast amount of data that will be made available via new technologies like the smart meter in private households.

Private households of today are also becoming increasingly more capable of providing flexibility to the energy system. For example, operators of rooftop photovoltaic generators could, in theory, curtail their feed in when the stress on the grid is high. Modern electrical heating appliances, in combination with a heat storage, could be controlled in such a way that the energy for heat is drawn when general demand is low in order to balance the grid better and lessen the stress on the grid and generation.

Beyond the boundaries of local DSO´s small scale flexibilities could also be aggregated to one large virtual source of flexibility. With these larger and more powerful flexibilities a community of residential customers could provide flexibility to the national or even European energy system. Such virtual balancing powers could participate in local, national or European markets for balancing energy and provide a valuable service for a safe and reliable energy supply.

DSO´s in Germany today already have a mandate to curtail and control small scale generators to avoid violations of technical limits of the electrical infrastructure. The mechanisms are tightly regulated but have proven very effective and useful to keep the energy system safe and within its technical limits. The controlling mechanisms of today however have three major limitations:

1. They lack the communication infrastructure to control a large number of relatively small scale (LV-connected) sources of flexibility such as rooftop PV, residential energy storage or electrical heating appliances in a secure and reliable way.

2. They lack the data processing capabilities to handle and leverage a large amount of data from numerous sensors across the grid and hence cannot take full advantage of a smart meter roll out.
3. They lack the computing power to derive a plan of action from a massive amount of field data.

The Smart Grid Hub is envisioned as an extension of today´s grid control center of a DSO and is supposed to address all the challenges mentioned above. A fully operational Smart Grid Hub will enable the DSO to

1. Collect, process and store a vast amount of data acquired by a digitial metering infrastructure on the residential level.
2. Derive switching and dispatch schedules for all connected sources of flexibility regardless of technology to ensure a safe, efficient and reliable operation of local MV and LV grids.
3. Carry out these schedules and switching programs via an individual and secure communication infrastructure to ensure a maximum of security and reliability in the process.

The following document details the architecture of the Smart Grid Hub, its data hosting capabilities and functionalities and gives a brief insight how these functionalities correspond to the field test of later project phases.

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1 INTRODUCTION

As renewable energy becomes more competitive and industrialized countries strive to reduce their carbon emissions by replacing large-scale power stations with smaller decentralized units the pressure on local power grids to adapt to this new reality grows. Germany is among those countries, where the change from fossil fueled power stations towards decentralized renewable generators is already happening. This change from a few large controllable generators to numerous small ones that are fluctuating based on the current weather has massive implications for the rest of the national and European power system.

Distribution system operators (DSO) in Germany today have to deal with a significant increase in feed-in power from decentralized energy resources (DER). These DER are allocated based on local weather patterns, communal planning, private initiatives and the accessible open space. The capacity of the electrical network at any given location has no direct impact on the allocation of new generators and subsequently the rise of these new generators can create local and regional hotspots of fluctuating generation which cannot be handled by the existing grid at all times.

The solutions to this problem are manifold. For example, the DSO can opt to reinforce and expand the existing grid. This addition of assets however can be very costly, it takes time and recently the public acceptance of ever new overhead-lines has diminished.

If the continued expansion and reinforcement of the physical grid is not the answer then an alternative way out could be to make loads and generators more flexible and to control them in such a way that the system remains in balance. By ramping loads and generation up or down based on grid constraints or in response to a market signal, a significant portion of the estimated grid expansion could potentially be saved. Today's generators and loads along with recently developed technologies such as power storage devices or electric vehicles present a large pool of hitherto untapped potential of power-flexibility. The German DEMO of InterFlex aims to develop a central entity dubbed the "Smart Grid Hub" which could access this dormant flexibility and leverage it to increase the efficiency and utilization of the existing grid in order to avoid an expensive expansion of the physical grid.

This document shall provide an overview over the functionalities and architecture of the envisioned Smart Grid Hub and highlight its key features to be demonstrated over the course of the project.

1.1 Scope of the document

1.2 Notations, abbreviations and acronyms

The table below provides an overview of the notations, abbreviations and acronyms used in the document.

DSO	Distribution System Operator
EC	European Commission
EU	European Union
SGH	Smart Grid Hub
MV	Medium Voltage
LV	Low Voltage
DER	Decentralized Energy Resource
SMGw	Smart Meter Gateway
SMGWA	Smart Meter Gateway Administrator
MStBG	Messstellenbetreibergesetz
BSI	Bundesamt für Informationssicherheit

Figure 1: List of acronyms

2 THE SMART GRID HUB

The Smart Grid Hub (SGH) is part of an integrated concept to enable the grid control center of a DSO to access and directly control small scale flexibilities of any type in response to violations of technical grid constraints or even external market signals. Other crucial parts of this concept are the communication infrastructure and smart-meter gateway administration, intelligent (digital) metering devices and control boxes at the customer's premises.

The general protocol for the use cases during the Smart Grid Hub field test phase are as follows:

1. Grid control provides an estimate of the state of the MV- and LV-grid, based on technical data from grid sensors (voltage, current), customer sensors (consumption, feed-in) and external factors like the weather.

2. Based on these state estimates grid control can identify potential imbalances in specific areas of the grid or impeding or existing violations of technical limits like local voltage excess or current overload of assets (grid congestion). To bring the local grid back to a balanced state and / or to relieve local grid congestion a cascade of actions can be taken.

3. In the cascade of action grid control tries to re-balance the grid by altering the current state of operation with switching actions. The second step is to leverage local flexibility in order to relieve congestion and to return to a balanced state. If both these strategies fail, a more heavy-handed approach of grid safety measures has to be taken.

4. The SGH monitors the current status and availability of all sources of flexibility at all times.

5. If necessary grid control can request a certain amount of power ramp up or ramp down in a specific area of the grid. The SGH will then determine the optimal strategy to deliver these actions while keeping total intervention at a minimum and send control commands to achieve the desired outcome.

At its core the SGH is a control solution in the environment of intelligent metering systems. The SGH accepts control requests, processes data from sensors and metering devices, analyzes data, determines the optimal set of action to achieve the desired outcome and finally sends control signals to the flexibility source at the customer's premises.

The SGH is split into two separate units, namely the process unit and a data unit. The data unit is supposed to collect, host, aggregate and provide data for the process unit. The process unit on the other hand contains the algorithms and logical functions that a dynamic switching and control strategy for flexibilities requires. Because it has the ability to switch and control units in the field, the requirements for reliability, security and speed are comparably high. It is envisioned as a central high speed solution to provide metering, data analysis and controlling /switching schedules with a very high granularity. It is not only able to determine optimal switching schedules, but also to aggregate and assign dynamic grid-clusters that will subsequently be addressed with control signals.

2.1 Smart Grid Hub Architecture

The Smart Grid Hub is a control- and dispatch unit in a digital environment. The SGH accepts control signals from the grid control center, processes structural data and data from sensors and digital meters, analyses data and determines switching actions and schedules based on algorithms derived from technical guidelines, legal obligations or requirements from grid operation.

At its core the SGH consists of two parts:

- **A process unit** which is handling the requests and performs switching and controlling action with a reliability, security and availability to the standard of the grid control center itself. To ensure full compliance with the required standards the process unit must be located within the process IT environment.
- **A data unit** which consolidates and provides data from other sources within the company. The data unit synchronizes with other data bases on a regular schedule and provides data to the process unit at request. Crucially the data unit does not have to perform to the same standards as the process unit and can hence be located in the standard commercial IT environment.

2.2 Interfaces and integration with existing systems

The Smart Grid Hub will act as a central processing and data unit to leverage large amounts of data for grid optimization and automation Figure 2 shows how the SGH fits into the general architecture.

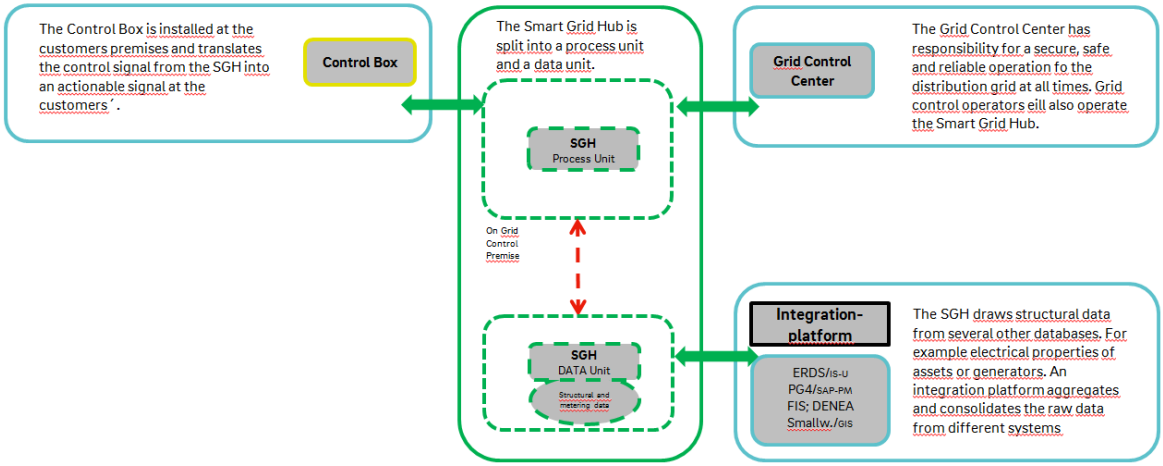


Figure 2: Location of the Smart Grid Hub and major Interfaces

2.2.1 Smart Meter Gateway, Control Box, Digital Power Meter

To get access to the flexibility on customers' premises there has to be a digital meter, which can provide the data necessary for efficient operation and which complies with all relevant guidelines on data security. To translate the control signals coming from the SGH there has to be a controlling device on site, which takes the form of a tried and tested control box. The control box can receive control signals and translate them into actionable commands for the local generator, load or battery. Finally to ensure a secure and legal mode of data transmission and communication a Smart Meter Gateway (SMGW) is added.

2.2.2 Gateway Administrator Environment

Under the umbrella of "EniM" E.ON has created the platform to comply with legal obligations for the current and upcoming roll out of intelligent metering devices.

According the legal definition an intelligent metering system is "a metering device that is integrated into a communication network and which can monitor and measure the actual energy consumption and time of use".

An intelligent metering system consists of a digital electricity metering device and a communication module, the so called Smart Meter Gateway (SMGw). A SMGw can be connected to one or more metering devices. The intelligent metering system is monitoring

the consumption on site and can transmit the consumption data via a secure encrypted channel fully automatic to qualified third parties, the customers merchant or grid operator. For customers these devices can open the door to more flexible, time variable tariffs, while the high-granularity data can help grid operators to better utilize his infrastructure and avoid critical situations.

The SMGw is being operated by a service provider who fulfils the role of a Smart Meter Gateway Administrator (SMGWA) and is responsible for the secure and reliable operation of the SMGw. A SMGWA has to comply with all requirements derived from the National Law for Meter Operators (Messstellenbetreibergesetz MsbG) and to have his Information-Security Management System certified by a third party auditor. Additionally the SMGWA has to comply with further requirements regarding the security of data transmission and hosting. For example the federal agency for cyber security (BSI) requires SMGWA to comply with the technical guideline TR-03109-6.

2.2.3 Grid Control Center

The Smart Grid Hub will work closely with the grid control center of Avacon. The current SCADA system monitors the situation of the grid, determines switching schedules collects and stores data and provides state-estimates for the entire network operated by Avacon. The SGH will be connected directly to the SCADA and will receive request and control signals from there.

2.2.4 Integration Platform

The integration platform (IP) is based on SAP PI technology. It will provide the interface between the SGH data unit and all other data sources at the DSO. The IP itself does not store any data, but it establishes connections to other data sources. At request the IP provides data to the SGH via web services (push-services).

2.2.5 Other Data Sources in the DSO Environment

In addition to data from sensors and meters across the grid the SGH will also utilize structural data such as electrical properties of generators or assets, weather or load data. Depending on the function and challenge at hand, the SGH will take into account any number of data.

2.3 Data Architecture

The Smart Grid Hub will have to leverage a large amount of different types of data in order to deliver the envisioned gains in efficiency and effectiveness. Reflecting the two-stage architecture of process- and data unit the data model itself will also discriminate between:

- **Basic Data** which includes information about the relevant elements for operation and which are required for ongoing processing. Base data consist of information about assets and active elements (generators and loads), Smart Meter Gateways, metering devices and control boxes. Base data are sourced via the data unit and integration platform from other data sources.

- **Operational Data** that are being created constantly during operation. The operational data consist of metering data (current, voltage, power), switching schedules and other information relevant for switching and metering actions. Operational data is sourced from sensors and meters across the grid.

- **Guideline-Data** which include scenarios and protocols for carrying out field tests. Guideline-Data is being provided via manual input from the operator.

To account for the fundamentally different requirements for the different types of data especially for persistence, actuality and availability the SGH has to be designed as a two-stage system with two different technical entities, namely the aforementioned process- and data unit. These units are separated, the data models for base data and operational data are separated as well. There is a redundancy for base data built in between the two units, for operational data there is no redundancy. Instead, the operational data is stored only temporary in the process unit and regularly backed up in the data unit.

2.3.1 Smart Grid Hub Base Data

The Basic Data System hosts all general data about the relevant elements for operation. These sets of data are acquired from other system in the DSO environment and fed into the Data Unit via the integration platform. Within the Smart Grid Hub architecture the Data Unit is considered the leading source of data. If data is being stored redundantly and differences between two sets of data are recognized, the leading source of data is considered the correct one. The Process Unit obtains data via an interface that is capable of being parametrized.

2.3.2 Initial Data Collection and Updates

The Data Unit obtains all data via the integration platform (IP). The IP acts as a central data hub with access rights to all other relevant data sources and data bases within the corporation. The IP provides web services through which the Data Unit can request and receive all the data necessary. These web services are designed in such a way that the Data Unit can directly generate base data objects. The initial process of gathering all the base data and the following cycles of data updates are triggered manually by the operator via the user interface. Results of each base data update have to be simulated first and get documented in an update log file.

2.3.3 Base Data Updates

Updates of base data in the process unit are being carried out on a regular basis. The actual duration between data updates can be determined by the operator.

2.3.4 Base Data User Interface

To access, view and document base data that is stored in Process and Data Unit, the Data Unit contains an user interface. Via this user interface the base data in the Data Unit can also be modified if necessary.

2.3.5 Monitoring of Base Data

The initial data collection, all updates of base data and all synchronizations of base data between Data and Process Unit are being logged in the Data Unit. Monitoring logfiles can be accessed and viewed via the user interface.

2.3.6 Operational Data

Operational Data is created when electrical values are being measured by the intelligent metering systems at the customers' site and include voltage, current and power. Additionally all data relating to the state (or change thereof) of the control box is considered part of operational data. All operational data has a timestamp and enable the Smart Grid Hub to infer feed-in, consumption, energy volumes and state of the grid. Operational data is stored temporarily in the Process Unit and transferred and stored in Data Unit on a regular basis. Once transferred to the Data Unit operational data is being deleted from the Process Unit.

3 FUNCTIONALITIES

The function "Smart Grid Hub Process Unit" follows a workflow with 3 process steps as shown in Figure 3. A command initially goes through general function blocks, such as authorization checks and/or grouping. The second function block maps the individual functions. The third function block is processing results and handling transmission to the customer. The execution of the command is independent of whether the command is transmitted by the network control center or the SGH Data Unit.

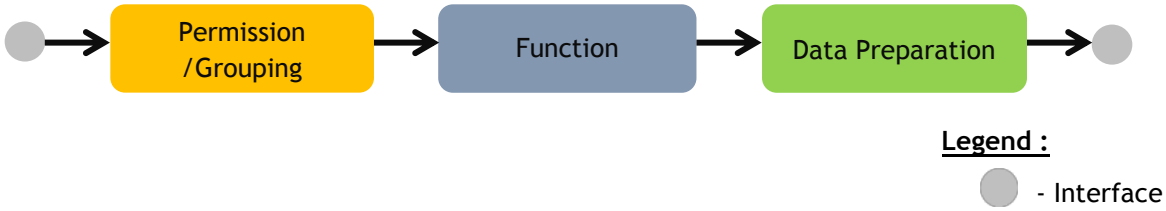


Figure 3: Workflow of Smart Grid Hb Process Unit

3.1 Creating and Assigning Groups

The "Create group" function is used for the aggregation and breakdown of the units, which are distributed in the network, into groups.Additionally existing groups shall be aggregated into higher-level groups. A unit or a group can be assigned to several (superordinate) groups. The assignment of a unit or a group to a (superior) group is dynamic. Consequently attachments or groups, which are already allocated, can be removed or new units or groups can be added. This results in a hierarchical arrangement of the units or groups.

The network area group is the highest hierarchical level. A network area comprises of one or more local MV/LV substations. Consequently on the second hierarchical level groups of the local network stations will be located. Below these two levels any number of additional levels can be set. At present, at least 5 hierarchy levels are required.

For the creation of a new group, a new group name is sufficient. The assignment to a hierarchy level depends on the assignment of the created group (assignment to a higher-level group as well as the subordination of units or further groups). If no assignment is made, the group is assigned to the hierarchy level of the network areas.

Therefore a group is directly or indirectly subordinated to a specific number of units across several hierarchical levels as well as subgroups. Figure 4 shows a possible group structure. This example shows that system 1 is directly assigned to the group "> 10 kW installed power PV". Unit 2 is also part of this group. For example, if the measured values of this

group shall be read out, only the measured values of the two subordinate units will be determined. The group "Photovoltaic", which is superordinated to this group, also includes installations 3 and 4. Independently from the subordinate groups, installations 1 to 4 can be addressed via the "Photovoltaic" group.

Overall the measured values can be divided into network area, local area network, plant type or others, and be viewed deliberately and differentiated from the large number of measured values.

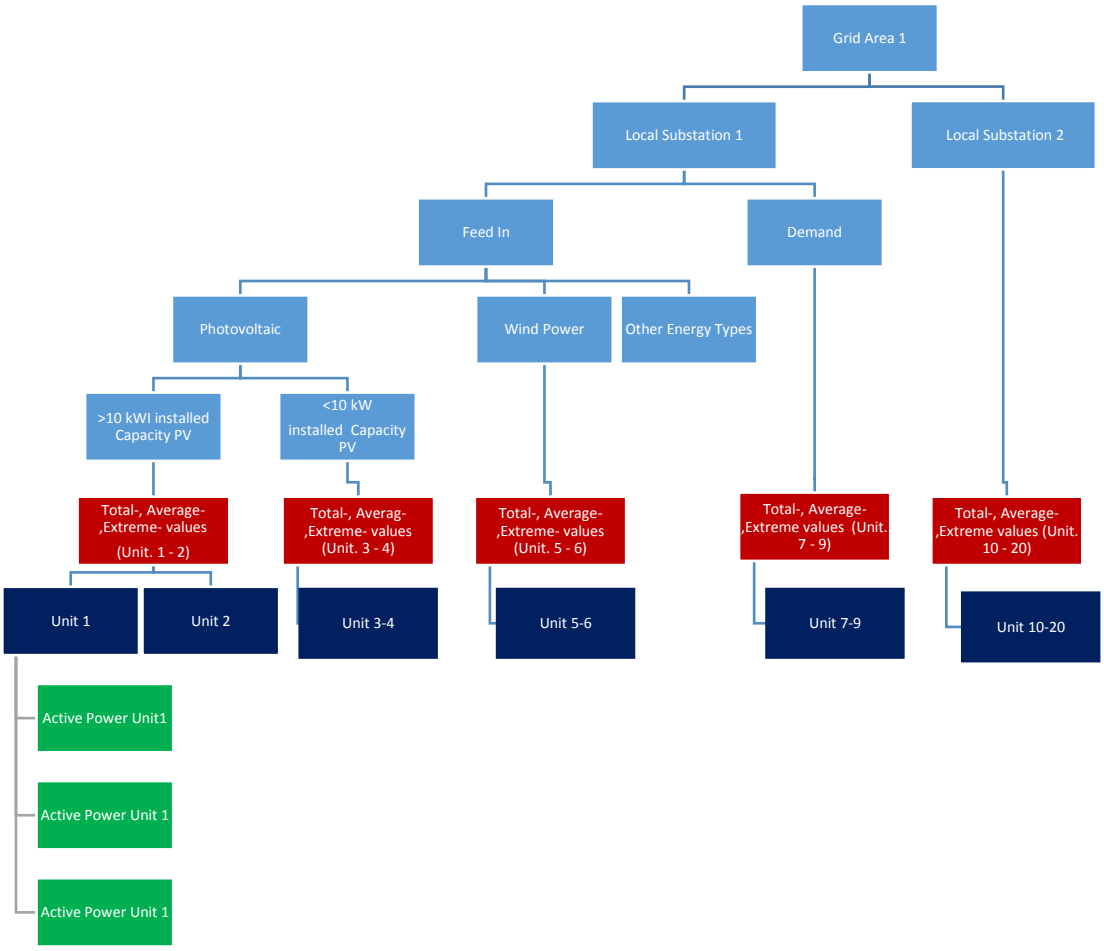


Figure 4: Hierarchy of Objects in the SGH Environment

The characteristic "Flexibility yes / no" should be assignable to a group. If the characteristic is set, the respective reserve for the group is calculated automatically.

3.2 Measurement

The function "Measurement" is used to carry out individual measurements in the network.

The measurements or possibilities of the measurements are given in the technical guideline (TR03109-1). As shown in Figure 5 the measured value of different groups and units can be assigned to a local network station.

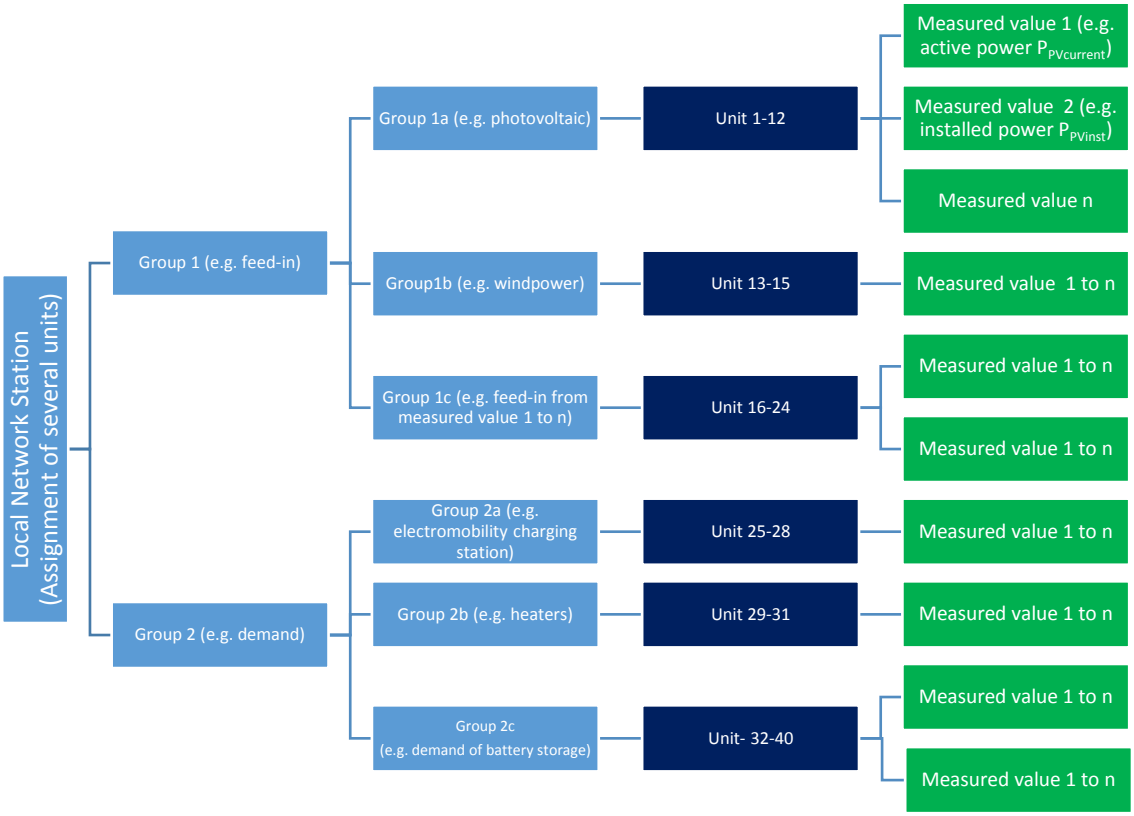


Figure 5: Example of the assignment of measured values to an local network station

In addition, the installed SMGw provide information about possible measuring types (Measurement of voltages, current, power values, phase shifts, etc.).

The "Measurement" function processes the parameters

- Group or network area to be queried
- Query interval in sec.
- Command type; Start or stop
- Optional: Period of Validity in min.
- Infeed or Demand
- OBIS counter depending on the expected measured value

If the function is called with the command "Start", the parameter set for TAF9 or TAF10 of the SMGw will be sent to the GWA. In consequence the corresponding SMGw can be parameterized and the measured values will be send directly to the HES of the EMT. Depending on the measured values, the TAF9 or TAF10 will be parameterized or not, which for example can be a feed-in value or a network state like the voltage.

During the response to a group, all associated SMGw and the transfer of the respective TAF via the GWA will be parameterized simultaneously.

The measured values received and decrypted by the HES, will be forwarded and stored in the SGH by passing the module "Routing". If necessary, further automatic functions for the KPI calculation are triggered during the storage of the measured values. Therefore all required current measured values (transferred and calculated) will be continually accessible in the SGH.

Figure 5 shows a possible structure of the assignment measures values of different groups to a local network station.

3.3 Switching

With the function “Switching”, either a direct command is sent to the control box via the protocol IEC61850, or a corresponding schedule will be created, transferred and activated to control box. Beforehand a proxy channel must be established between the control box and the SGH.

The function processes the following parameters:

- Group or network area to be switched
- Switching operation (value 0/30/60/100% of nominal power)

After the switching command or schedule is transmitted to the control box, the relay outputs of the control box will be set according to the desired switching operation.

The function returns a status signal, which indicates success or fail.

In case of a group switching, all associated control boxes will be controlled and receive a switching command simultaneously.

3.4 Rules based on performance values or relative values

The "rules based on performance values or relative values" function is a combination of measurement, switching and a control algorithm, which is in between.

The processed parameters are:

- Group or network area to be controlled
- Percentage or absolute change (% or kW) (target value)
- Feed-in or load power

Prerequisite for this function is the start of the "Measure" scenario, so that current measured values are available via the system group in the SGH. The sequence of this function is as follows:

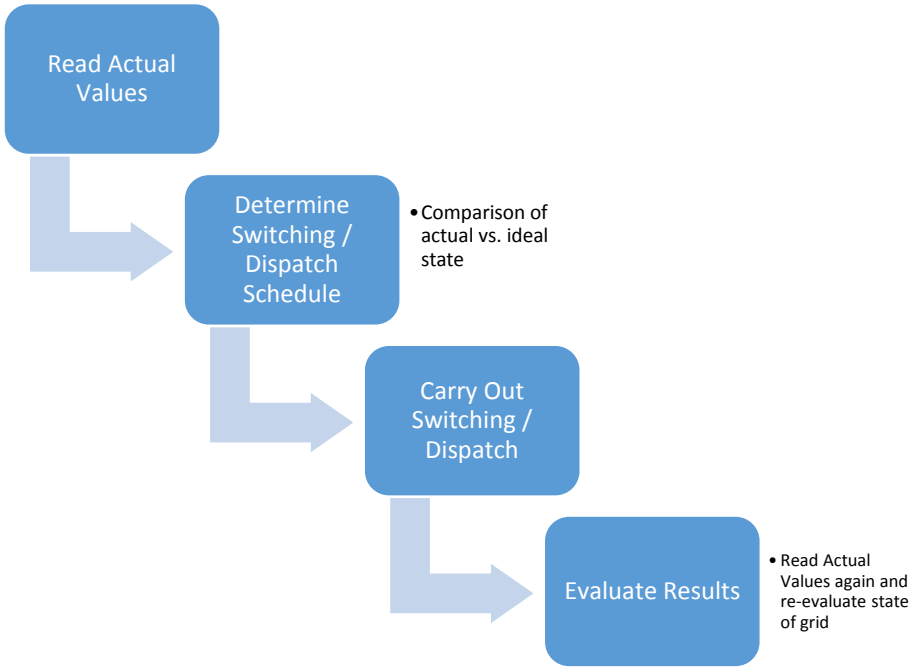


Figure 6: Process Sequence « Rules based on performance values or relative values»

The switching requirement, which has been determined, is identical to the content of a group of units, which are switched to the ascertained property value. In the next step, the switching operation is performed by calling the function “switching”. The next step checks the result and decides whether a further control cycle should take place or the control process has to be completed. After completion of the function, the system registers whether the target value could be reached or not.

3.5 Determine the level of curtailment

The “Determine the degree of curtailment” function determines the reduction level (relay status) of the control boxes via the IEC61850 protocol and stores these in the system-related SGH including unit-related date and time. For this, the proxy channel between the control box and the SGH must be set up in advance.

The function processes the following parameters:

- Group or network area to be queried

The current reduction level is stored in the SGH and can be further processed from there.

3.6 Determine and provide flexibility

The function "Determine and provide flexibility" checks whether in the grid switchable loads are available and displays them. A detailed description of the term "flexibility" can be found in the chapter "Glossary" (see 10.1.1 Flexibility).

For one or various previously selected group flexibility has to be determined for several selected groups. First, the "Measure" function is used to collect measured values for the determination of the flexibility. The measured values will be aggregated per group. The aggregation of the measured values will automatically take place in the database at the level of the defined group.

As show in Figure 7 feeders and loads are differentiated and processed separately within the group. As a result, the flexibility for the

- Feed-in and
- Demand

is determined within the group and stored as a calculated value in the SGH. Time and date will be stored group related. When the database receives a whole package of measured values, the aggregation will start automatically. The time intervals between the individual measured values must be determined in practice.

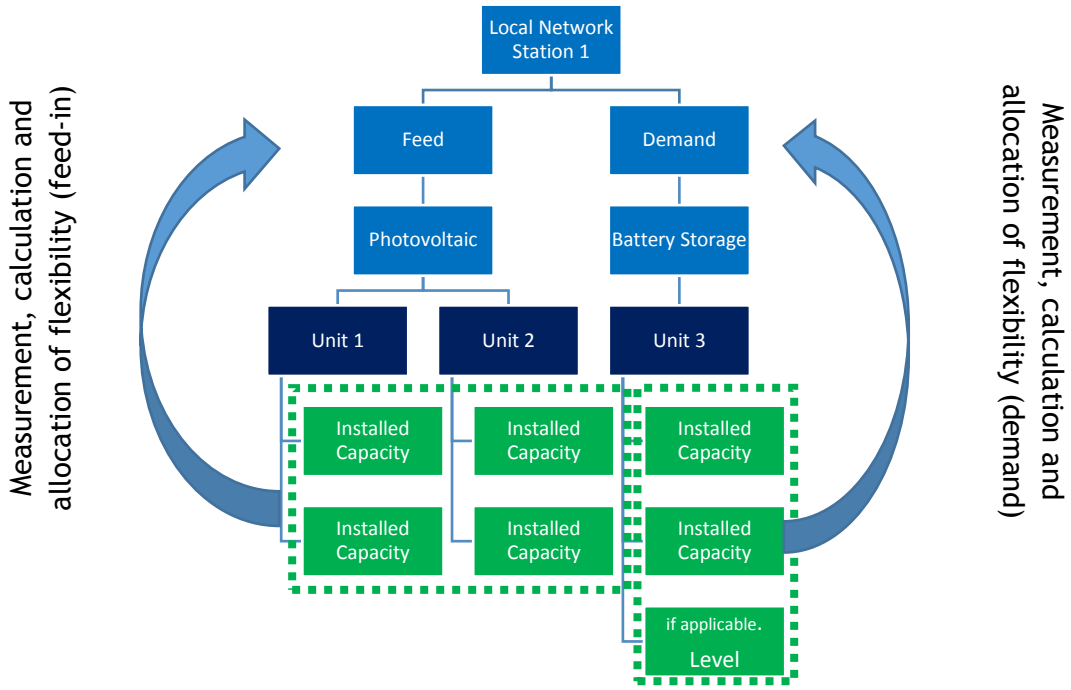


Figure 7: Example of the allocation of flexibility

3.7 Set and receive threshold values

The setting of threshold values is specified in the technical guideline (TR03109-1). The TAF10 is parameterized for each system.

The "Thresholds" function processes the parameters:

- Group or network area to be queried
- OBIS counter for the measured value to be monitored
- Threshold value
- Operator (greater / smaller / ...)
- Command type; Start or stop monitoring

The function will be called with the command "Start". During the call, the parameters for TAF10 of the SMGw will be sent to the GWA so that the corresponding SMGw can parameterize and monitor the corresponding measured values and send threshold violations directly to the EMT.

A parallel parameterization of all associated SMGw and the transfer of the respective TAF via the GWA will be performed, when a group is approached.

SMGw reports a threshold violation and statistical filter.

The threshold violations received and decrypted by the HES are forwarded directly to the SGH through the "Routing" module and stored in a plant-specific manner.

Incoming threshold violations will be monitored within a group by a statistical filter function. The statistical function will monitor the incoming messages per group and per unit of time. When a certain value is reached, a relevant message will be saved as a KPI of the unit or group. The parameters processed in the function are:

- Group or network area to be monitored statistically
- OBIS counter for the measured value to be monitored
- Number of messages
- Period in which the messages must arrive

Function "Determination, calculation and provision of totals, average and extreme values in groups"

When creating groups, automated KPI functions are used for total, min. Max. values or statistical filters. Depending on which measurement values are requested and received for a group of units, the associated KPI's of the group will be calculated. Whenever a complete package of measured values has been completely stored in the SGH, the corresponding KPIs will be formed. The following KPIs will be generated as a function of the incoming measurement values and status data within the group.

3.8 Scaling of measured values

Due to the small number of 200 plants in this pilot project (small number of iMS per total number of all measuring systems in one area), scalability of the measured data shall be enabled so that the influence of the measured values on the observed network area in the network control system increases. A freely selectable integer multiplier shall enable the scalability.

Example:

- The active power of a photovoltaic system is 5kW
- Scaling multiplier is set to 100
- the measurement values will be increased by a factor of 100 to 500 kW
- the scaled measured value is now 500kW (active PV system)

The scaling multiplier is selectable for one or more groups and applies to all attachments within the selected group.

The resulting values are to be processed as measured values by means of further functions (eg the function "determination, calculation and provision of total, average and extreme values in groups") without noticeable time delay and consequently shall be rapidly available for the network control system. The scaled measurement data will be stored as independent measured values. Scaled measured values should be visibly highlighted / highlighted.

3.9 Provide CLS Switch Channel

The "provide CLS switch channel" function is used to open a control channel in advance, if controls are known or high likely beforehand. This function prevents a peak of data volumes in the WAN. In addition, the switching operations can be performed faster with an open channel.

The parameters used are:

- Group or network area to be monitored statistically
- Time of channel maintenance

4 USE CASES AND FIELD TESTS

The objective of this Demo is to design and implement the Smart Grid Hub and demonstrate its capabilities to increase the efficiency and utilization of existing grid structures. In order to do so the field tests are designed around three Use Cases that will be addressed by the SGH.

4.1 Use Case 1 – Feed In Management

Under current legislation grid operators in Germany have the obligation to integrate as much renewable energy into their networks as possible as long as technical parameters are kept within limits. If the grid operator identifies an impeding violation of technical parameter or grid congestion he can curtail the feed-in from those generators which cause the congestion for a limited duration. With the technical architecture of today however most grid operators have no direct access to generators in mid and low voltage networks and can only send control- and curtailment signals to large groups of these units. Since these small generators make up for the majority of units the feed-in management of today is not very efficient and neither precise. With a growing number of grid congestion incidents grid operators are now at risk of having to curtail more energy than what would be necessary, because of their lack of precision when sending curtailment signals to small scale generators. Today grid operators rely mainly on long wave radio signals, which is

neither very precise nor does this mode of communication provide a backchannel, hence the grid operator never really knows whether or not the control signals were received and acted upon. The Smart Grid Hub should provide the capability of controlling small scale generators even at the low voltage level via digital switching and by leveraging the digital metering infrastructure of the future. Subsequently the SGH also enables the grid operator to perform a much more efficient and effective feed-in management to relieve grid congestion.

The goals the SGH should achieve are:

1. Increase stability and reliability of distribution networks.
2. Increase transmission and distribution capacity of local grids.
3. Increase security of supply particularly on lower voltage levels.
4. Anticipate and leverage the rollout of a future Smart Meter Gateway infrastructure.

The Use Case "Feed-In Management" in the sense of this Demo can target one or more areas of the grid. These grid-sections are not necessarily static, but they can vary and evolve depending on technical constraints, local demand, generation and restriction from grid operation like maintenance or faults. The goal of creating the Smart Grid Hub is to take the feed-in management of grid operators to the next level by significantly increasing the number of accessible elements and by controlling these elements with much greater precision.

The entire process will be initiated by the grid control center for different objectives and levels of priority.

4.2 Use Case 2 – Demand Response

To keep the grid within technical limits and to avoid the overload of assets or excess voltage at customer's premises the grid must be kept in balance. Ideally the balancing strategy of grid operators follows the principle of subsidiary, trying to achieve the best possible balance at each voltage level before handing over any imbalance to the next higher voltage level. In low voltage networks for example an excess of renewable feed in from small scale generators can cause an imbalance and excess voltage at the residential level is a real issue even today. To address these challenges the grid operator can opt for a number of strategies, for example to expand the network or to utilize nw technologies such as voltage regulating distribution transformers. On an operational level the grid operator could in theory steer generation and demand in such a way as to keep both in balance as long a s possible. While Use Case 1 "Feed-In Management" aims to address the

efficient control of local generation Use Case 2 “Demand Response” deals with the other side of the equation. In order to balance the grid on a local level, grid operation could send control signals to flexible residential loads, such as

1. Charging points for electric vehicles
2. Controllable heat pumps
3. Electrical heaters
4. Batteries
5. Electric boiler

to increase or decrease local demand as necessary. In practice one could imagine to ramp down flexible loads during times of high demand and little or local feed-in. Likewise, these loads could be ramped up when local generation picks up again to avoid a spike in feed-in.

In order to identify potentially critical imbalances in time the grid control of today already employs a sophisticated state-estimate algorithm which relies on sensors across the grid. The Smart Grid Hub adds the data from residential metering devices to increase the precision and reliability of these state-estimates and aides identification of critical imbalances. Once a critical situation is identified the SGH can send control signals to the flexible loads to rebalance the network. For the purpose of the field tests over the course of Interflex households can participate on a voluntary basis.

4.3 Use Case 3 – Ancillary Service Provision

This third use case is a combination of the first two and combines the flexibility of both generators and flexible loads. The general idea is to aggregate the flexibility from small scale generators, flexible loads and batteries and either leverage it to support the local grid on a larger scale or even to provide flexibility to third parties such as other grid operators or market agents.

For example:

1. Local flexibility could be aggregated to provide primary, secondary or tertiary control power to the transmission system operator. In that scenario the DSO would act as an aggregator and participate in the bidding market for balancing energy and sell flexibility to the TSO.

2. Local flexibility could respond to requests from grid control in order to support higher voltage levels or to relieve congestion on higher voltage feeders. Even though there is no market mechanism for DSOs in Germany to procure flexibility from third parties or to

take advantage of local flexibility, this might become an option in the future. Under this scenario he focus is to demonstrate the technical viability and effectiveness, regardless of the current market design or regulatory barriers.

3. Local flexibility could be provided at request to other third parties. For example, the SGH could aggregate flexibility and provide it to larger aggregators. It could offer flexibility to industrial customers who maintain their own balancing circle or run their own power generation in order to optimize their power supply portfolio.

In general these third party models and aggregator function depend largely on the regulatory framework and market design at the time of operation. While we cannot anticipate the direction of new developments in those areas, we can take this opportunity to demonstrate the technical capabilities and the flexibility of the SGH to provide value in a number of scenarios.

5.2. Annex 2 – Group Policy Supply Chain

This project has received funding
from the European Union's Horizon 2020
research and innovation programme under
grant agreement n°731289

Business Governance Group Policy
GP 3-28

Supply Chain (Procurement)

Date: 15.02.2016

Table of Content

1 Objectives and Background

The E.ON board has given the Support Unit Supply Chain the full mandate to procure all external spends in E.ON reflecting the business requirements. The Supply Chain organization either directly executes procurement processes or sets the framework for the business to procure themselves (in areas specified by the Supply Chain organization), as regulated in this Policy.

This Policy is designed to define all relevant duties and responsibilities within the procurement processes and to ensure effectiveness and compliance within the E.ON Group. It also clarifies what can be expected from the Supply Chain organization (deliverables) and what the requirements towards the business are.

The objective of this Policy is to

- define overall and group wide operational principles for the Supply Chain organization
- define group wide valid processes and tools for the Supply Chain operations: ensure clear compliance with other relevant group wide processes
- clarify the interfaces to the business, as well as Accounting, Legal, EBS etc.

The application of this Policy is mandatory. In case of a breach of this Business Governance Group Policy the respective regulations of the Management Group Policy 1-1 apply.

2 Scope and Implementation

This Policy covers all goods and services procured by E.ON. However, all permitted exceptions where the Supply Chain organization does not need to be involved (e.g. fuels, financial transactions, donations) in procuring these are stated in this Policy, Appendix 01 “Exception list”. For “small volume orders”, the Supply Chain organization only has to be involved as described in Appendix 02.
For all demands, health, safety and environment risks have to be assessed by the requester.

This Policy applies to all E.ON companies, where E.ON SE is directly or indirectly the majority owner. It also applies to joint ventures where E.ON has a controlling interest (normally at least 50%) and to companies where E.ON is responsible for management and operation of the company. In addition, any agency staff and all contractors’ employees involved in procurement activities on behalf of E.ON are expected to meet the requirements of this Policy. This Policy governs all procurement processes including all tools, systems, templates and forms used within the processes.

This Policy must be read in conjunction with

- Management Group Policy Procurement /Supply Chain (GP1-32)
  which details the procurement/Supply Chain mission, the organizational setup of the Supply Chain organization and the roles and responsibilities of the involved parties

In addition it relates to the following binding policies:

- Supplier Code of Conduct, Version 01.2016

This Policy replaces all existing procurement guidelines, handbooks, policies and management instructions in all organizations of the Supply Chain within E.ON. Any additional guidelines and tools influencing the procurement process that may be needed must be aligned closely with the Supply Chain Center of Competence (CoC) Governance & Performance.

Each E.ON company is responsible for the timely and effective implementation of this Policy. Each Head of Procurement (HOP) is responsible for supporting the implementation by proactively informing requesters and line managers in the business.

In cases in which a deviation of this Policy is considered necessary due to legal requirements, the responsible legal entity shall notify the case to the CoC Governance & Performance and ask for approval. Documentation of the approval or denial of the deviation will be done by the CoC Governance & Performance.

Procurement processes within E.ON are based on GLOBE SAP. GLOBE SAP processes need to be strictly adhered to by all E.ON employees involved in procurement activities. In units where GLOBE SAP is not yet implemented, intermediate processes must be agreed with CoC Governance & Performance to ensure that all procurement activities are closely aligned with the E.ON standards provided by this Policy.

3 Overarching Principles

Segregation of duties between Business, the Supply Chain organization and Accounts Payable throughout the entire procurement process must be ensured in all units by the respective management. A consistent following of the GLOBE SAP processes by all involved parties supports to fulfill this task. Splitting of demands as well as splitting of contracts in order to circumvent any thresholds is not allowed.

All employees who take part in procurement activities have to comply with the following principles of the Supply Chain organization:

3.1 Principles of fairness and competition

- E.ON staff will always act according to E.ON's Code of Conduct and to the Group Policies Procurement/Supply Chain (GP 1-32 and GP 3-28).
- All suppliers will be treated on an equal basis.
- Suppliers will be selected on a rational, transparent and consistent basis.

3.2 Ensuring confidentiality in the procurement process

All information during procurement activities have to be treated with a high level of confidentiality.

Procurement data, in particular all information regarding sourcing strategies, supplier relations, purchase prices, contractual terms & conditions are considered to be sensitive data.

Only staff of the Supply Chain organization and directly involved E.ON staff shall have access to the information contained therein. It is not allowed to share the information with any third party. It is not allowed to publish or otherwise let third parties know prices and names. This applies to ongoing as well as concluded tenders. Exceptions are justified, if:
- the information is used by a third party who is contracted to support the tender process, where a non-disclosure agreement must be signed in advance
- or if the information is demanded due to contractual or legal requirements (e.g. public utilities or insurance issues).

3.3 Cases of emergency

In case of an emergency (including imminent danger), to prevent any damage to E.ON
- regarding safety of people and environment
- regarding the availability of assets
- regarding the risk to negatively impact the service to customers
- to protect E.ON's legal interests regarding the observance of short-time deadlines set by the authorities or in case E.ON or E.ON employees are subject to official investigations which necessitate immediate legal action

the business is entitled to take necessary steps without involvement of the Supply Chain organization. The costs for these measures have to be limited as far as possible. The requester has to place the requisition in SAP as soon as reasonably possible and it must be accompanied by written approval of the requester´s functional manager.

The Supply Chain organization takes over responsibility of the procurement process as soon as they are informed by the requester. Emergency cases have to be documented in the tender documentation.

The respective Heads of Procurement have to provide a reporting at the end of each quarter (i.e. end of March, June, September and December) of relevant cases of emergency (i.e. above a threshold of EUR 100,000 or equivalent) to the respective board member of their legal entity and, in parallel, to their respective director of CoC/ Business Area Procurement (BAP).

3.4 Monitoring of Maverick buying

Purchases without involvement of the Supply Chain organization – i.e. Maverick buying – are a serious breach of this Policy and will be sanctioned by the respective line organization as a non-compliance issue. This does not apply for demands explicitly listed in the Exception list (Appendix 01) or for small volume orders (Appendix 02).

Incoming invoices which are recognized by Accounts Payable as "Maverick buying" will be sent back to the supplier without payment of the invoice.

To organize consistent follow up on cases of Maverick buying, the respective Supply Chain organization is required to monitor and escalate the following issues:

- Late purchase requisition set up by the requester leading to insufficient timeline for tender activities
- Purchase done by the business (without involvement of the Supply Chain organization)
- Service rendered or goods delivered (without involvement of the Supply Chain organization)
- Supplier has sent an invoice before purchase order has been placed in SAP

For these issues, the responsible purchaser is required to record the respective case in SAP. For details, see Appendix 03.

The respective Heads of Procurement have to provide a reporting (at least at the end of each quarter) of relevant cases of Maverick buying plus an ad hoc reporting of cases above a threshold of EUR 100,000 or equivalent to the respective board member of their unit and, in parallel, to their respective director of CoC/ BAP and to CoC Governance & Performance via the email account: procurement-processes@eon.com.

4 Procurement processes

The core procurement processes, which are illustrated in the following, must be followed for every sourcing activity above EUR 25,000 or equivalent. Below this threshold, please refer to 4.3.2 and Appendix 02. Above a threshold of EUR 1m, there are some special requirements indicated explicitly in the respective process steps.

4.1 Category Strategy

All purchasing categories that are managed by a CoC are called "global categories" irrespective of the underlying market situation.

The consistent definition and following of a sound strategy for E.ON's global categories is a prerequisite for a best-in-class approach to the market, a starting point and guidance along the entire Procurement Cycle and therefore an important driver of value for E.ON.
Therefore strategies for global categories need to be defined by the category team leader(s) and continuously aligned and communicated to the business. Where a technical category lead has been defined in the business, the development of the category strategy together with the Supply Chain organization is one of the technical category lead's main tasks.

A global category strategy consists of the following:

- Category overview
- Scope and characteristics of the global categories and its subcategories
- Analysis of the respective supply market & its dynamics
- Specific analysis and profiling of existing and potential new suppliers
- Analysis of nature of demand, subcategory structures, supplier allocations, cost drivers and volume forecasts
- Definition of category positioning in the supply/ demand balance and identification of levers for strategic category work and respective supplier panel
- Activity plan for execution of levers including set time frame and execution KPIs/ targets

The Category Strategy Process is supported, guided and tracked by CoC Governance & Performance.

Each global category team has to be prepared to present their category strategy for approval either to the Sourcing Board (CPO, respective CoC Director, BAP Director, and CoC Director Governance & Performance) or on the CoC level to the respective CoC Director and BAP Director. The alignment of the strategy prior to the approval, the scheduling of approval sessions, the detailed approval procedure and its communication to the global categories is managed by CoC Governance & Performance. Approved and valid strategies are communicated by the category team leads to the relevant persons within the organization and will be centrally stored on the CoC Governance & Performance drive.

The strategy has to be structured along a short-term perspective (one year ahead) up to a mid-term perspective (three years ahead). The category team is asked to give once a year an update to CoC Governance & Performance on status of the strategy, mainly focused on an overview on target achievements and, if needed, propose corrective measures to be taken. At the latest every three years or triggered by substantial

changes in key input factors of the strategy, the category teams will be asked to completely revise the category strategy and to present for approval on Sourcing Board or CoC level as explained.

4.2 Tender approval

Prior to start of the tendering, a tender approval process (3 steps) is established to ensure transparency of spend as well as a thorough procurement planning and to make sure all bundling opportunities are met.

Step 1: The responsible purchaser has to register every sourcing activity (creation of RFx-project) above EUR 1m or equivalent via the eSourcing platform as early as possible (e.g. based on a purchase requisition or a running-out contract), stating at least the topic, EPSC/category, expected value and targeted contract approval date.

Step 2: After having registered the sourcing activity the "tender scorecard" must be filled out (with all information available at that point in time) and regularly updated to reflect major changes. The scorecard gives a comprehensive overview of the sourcing activity covering tender scope, history, timeline, parameters and current status.

Step 3: The responsible purchaser has to get a tender approval based on the tender scorecard handed in and uploaded to the eSourcing platform. The tender will be approved from the respective CoC Director in case of an EPSC Code allocated to a global category type or from the BAP Director in case of an EPSC Code allocated to a regional category type.

Detailed information regarding allocation of EPSC codes to global or regional category types and the resulting responsibility of CoC/BAP director are summarized in the "category / responsibility list".

For the calculation of the demand value, the complete contract value(s) for the contract run-time including options has to be considered.

The responsible purchaser must, wherever possible, fulfill a lead-time of at least 3 months between registration of sourcing activity (step 1) and contract approval by the Sourcing Board.

This lead-time serves two purposes: On the one hand an early registration of sourcing activities ensures sufficient lead-time for preparation and execution of the tender activity; on the other hand it will support to set up a proper tender forecast for the Supply Chain organization in order to identify bundling opportunities. This tender forecast (extracted from the eSourcing platform) is important for efficient allocation of resources of the Supply Chain organization and therefore to generate best value for E.ON. It will be published to the CoC and BAP Directors on a regular basis.

The "tender scorecard" template and the "category / responsibility list" can be found on the Supply Chain/corporate procurement intranet.

4.3 Tendering

The tendering process is always led by the Supply Chain organization, but executed in close collaboration with the business. Alignment with the objectives of the business is as important as meeting the cost targets. Therefore, the Supply Chain organization has to be involved by the requester at an early stage in the specification of the demand.

Where a category strategy is in place, the responsible purchaser has to comply with this category strategy (see chapter 4.1).

Adhering to the tendering process and consistent documentation are prerequisites for approval of the contract. The usage of eSourcing is recommended for transparency purposes.

Where a global category team is in place, the tasks of the requester in the tendering process can be taken over by the technical category lead due to the decision of the category team.

The tender process has to be executed along the following five essential steps. Respective templates for documentation of the process are stored on the Supply Chain/corporate procurement intranet. This documentation requirement does not apply for tenders below EUR 1m or equivalent:

- Definition of tender strategy and tender targets (cost, quality, delivery)
- "Tender – Category Strategy" alignment (if global category strategy exists)
- For all non-global categories (for global categories please refer to global category strategy chapter 4.1):
    - Analysis of the respective supply market & its dynamics
    - Specific analysis and profiling of existing and potential new suppliers
    - Analysis of nature of demand, cost drivers and volume forecasts
    - Segmentation of category supply/ demand positioning
- Development of core elements of tender:
    - Scope of tender, i.e. technical/subject specific specifications, service level agreements, volume forecasts etc.
    - Tender design, i.e. lot structures, contract duration, pricing mechanisms, specific tender rules/ criteria (e.g. transparency level, cost savings idea contribution etc.)
    - Supplier list for tender participation
    - Overall tender and negotiation time line
    - Tender evaluation model
- Supplier selection for negotiation and initial negotiation planning

The responsible purchaser sets up the tender evaluation model early in the process and aligns upfront with the requester which evaluation model shall be used in the tender; Scoring "financial" parameters (e.g. cost/ price, payment terms, total cost of ownership, net present value, internal rate of return etc.) is a given,"non-financial" parameters (e.g. technical compliance, delivery terms, quality risks/commitments, references etc.) could be integrated if seen as essential for the awarding decision. The financial parameters shall have a weighting of at least 50 % in the evaluation model. The preferred model should use only "K.O.-criteria" (digital decision, if supplier fulfils criteria or not) and 100% financial evaluation.

E.ONs standard evaluation model (incl. definition of criteria types, scoring, methods, marking scales) should be used. If the responsible purchaser considers the standard model as not applicable in a sourcing activity above EUR 1m respective reasons have to be documented in the presentation to the Sourcing Board for contract approval. If the successful quote is selected on cost-components only, there is no need to set up an evaluation model.

The following principles apply:

- Tenders that bundle demands internationally or across business units (i.e. global tenders) are always executed on behalf of E.ON SE, where allowed by national legislation. Supply Chain staff involved in these transactions must indicate clearly to the third parties that they act as representatives of E.ON SE, not as a single entity.
- In the tender preparation phase, the leader of the negotiation (i.e. the responsible purchaser) will be announced and communicated. This person leads the negotiation process until contract signature.
- The run-time of an upcoming frame contract (and with this the total volume to be tendered) is defined by the responsible purchaser based on his market experience. As a recommendation, the run-times of frame contracts should not be longer than 3 years.
- For tenders in E.ON's global categories, the CoC Director sets a negotiation target or a range to be achieved. Meetings with suppliers for technical/subject specific clarification can be executed regionally, commercial negotiations should be held at the location of the respective CoC or Regional Unit Procurement.
- The category manager must be given the opportunity to participate in commercial negotiations. To ensure this, the responsible purchaser has to involve the respective category manager in the negotiation planning.
- The tendering process has to be clearly communicated upfront, both internally and towards the potential suppliers (e.g. timetable, planned number of negotiation rounds).

4.3.1 Specification

Tenders have to be based, wherever feasible, on a supplier-neutral specification (for goods and /or services) which has to be provided by the requester. The requester has the responsibility to describe the demand and the requested quality. Pricing shall be based on lump-sum and/or unit-prices. Time and material based tenders and contracts should be used in exceptional circumstances only.

The responsible purchaser has the right to challenge the specification together with the requester with the aim to reach the level of best value for E.ON.

4.3.2 Request for Quotation (RFQ)

The Supply Chain organization will issue requests for quotation only based on an approved requisition (including an approved budget). For frame contracts, this requirement does not apply, because it does not include a financial obligation.

Prior to this, the Supply Chain organization can issue a request for information, if appropriate, to get transparency on the budget need or to ask the suppliers for any sort of upfront information. In this case, the responsible purchaser has to make clear to the supplier that this quote is for informative purposes only and a competitive tender might be issued later.

The requester can only issue requests for information and quotation if mandated by Supply Chain organization. This mandate can only be granted in written by the respective CoC Director or Head of Procurement and is only limited to the RFI/RFQ process. Such information and quotations obtained from mandated requesters can be used by Supply Chain organization in the decision making process later.

When an RFQ is created, one of the standard text clauses regarding the standard payment terms has to be used to avoid legal concerns. Thus the supplier can choose between three different payment terms depending on the respective country cluster. For details regarding payment terms see chapter 4.8.2.

The minimum number of quotes required is 3 (three) for every demand exceeding EUR 25,000 or equivalent. Below this value, the responsible purchaser decides how many quotes are necessary. For details, see Appendix 02. In case that the minimum number of quotes cannot be obtained, the responsible Head of Procurement or CoC Director has to authorize this in writing (to be stored in the tender documentation). Authorizations can be done in the following ways:

- By signing of purchase requisition or
- By signing of purchase order or
- Via email

The responsible Head of Procurement or CoC Director can delegate the authorization to his/her leadership team.

The decision as to which suppliers will be invited to tender should be taken jointly by the requester and the Supply Chain organization. In case of disagreement regarding the tender invitation list, the final decision shall be taken by the Supply Chain

organization to ensure consistent supplier management. All invited suppliers must be provided with the RFQ at the same time to avoid any preferential treatment of selected suppliers.

4.3.3 Tender Return and Tender Opening

Tenders shall be handled in a fair and transparent way, treating all suppliers in the same manner to avoid manipulation, preferential treatment or fraud in the tender process.

The responsible purchaser will state in the tender instructions the timeline and the way quotes have to be submitted. Extensions of the time plan must be communicated via the purchaser to all potential suppliers to ensure equal treatment.

All quotes submitted for demands above EUR 1m or equivalent shall be submitted as hard copy to be opened by the Supply Chain organization, at a specified tender return date and time, following the instructions of the responsible purchaser. This hard copy requirement for tenders above the threshold does not apply in case of eSourcing. In case an eAuction is used during the tender process, please see "eAuction Training guide for Purchaser" on the Supply Chain/corporate procurement intranet.

Latest before the opening of bids the tender evaluation model needs to be set-up, aligned with the requester and left unchanged throughout the rest of the sourcing process. The initial tender opening has to be executed in the presence of the responsible purchaser plus one other E.ON employee and documented accordingly. This is mandatory for all tenders with an expected value exceeding EUR 1m or equivalent.

It is acceptable to have quotations with more than one part (technical/subject specific, commercial, legal part). The responsible purchaser shares the prices and further commercial conditions with the requester preferably after technical/subject specific evaluation.

For contracts below EUR 1m or equivalent, quotes can be submitted in electronic format (e.g. by email), subject to the decision of the responsible purchaser.

4.3.4 Evaluation of quotes

All tenders will be evaluated by the Supply Chain organization and, if applicable, by the requester (focus on technical/ subject-specific content). Based on the evaluation according to the predefined evaluation model, the Supply Chain organization and - if applicable - the requester will choose the final quote that proves to deliver the maximum value to E.ON based on the total cost of ownership consideration.

In the event of disagreement with the result based on the pre-defined tender evaluation model, escalation will be done via the requester's organization and via the functional Supply Chain organization.

4.4 Negotiation

During the negotiation, all contract-relevant questions regarding commercial, technical/subject specific and HSE issues with potential suppliers must be clarified (if not previously handled in a technical/subject specific clarification).

Methodologies to be used in order to obtain the necessary transparency and preparation for the negotiation are detailed on the Supply Chain/corporate procurement intranet. The outcome of the negotiation (including the presentation of applied methodologies) has to be presented to the Sourcing Board afterwards (see chapter 4.5), if the tender value is at least EUR 1m or equivalent.

The Supply Chain organization has to ensure a transparent process (especially an equal treatment of all potential suppliers) and document the negotiation results. The Supply Chain organization is responsible for economic and commercial aspects; the business is responsible for the accuracy of the technical/subject specific aspects of the documentation.

eAuctions are a valuable and recommended option to generate savings and shall be considered as an option for all tenders. Where all open relevant questions are clarified, eAuctioning can replace a face-to-face negotiation and can be conducted after the technical/subject specificalignment. If the responsible purchaser evaluates an eAuction as not applicable in a sourcing activity above EUR 1m or equivalent, respective reasons have to be documented in the presentation to the Sourcing Board for contract approval. Further details can be found on the eSourcing platform.
In case of using a tender evaluation model with less than 100% financial criteria the non-financial criteria should be integrated into the eAuction set-up, i.e. be transferring the non-financial evaluation result into a financial bonus or malus for the starting price in the eAuction event. It is targeted that the process is set up in such a way that the winners of the eAuction should always be the awarded winners of the sourcing activity.

4.4.1 Change of requirements / Variations to the Tender

Variations to the tender requested by the business pre-tender return have to be communicated at the same time to all tenderers issued by the Supply Chain organization. These tender variations have to be recorded in the tender documentation (incl. reasons for variations).

If a change of requirement (e.g. timeline) has implications on the competitive situation, the requester and the Supply Chain organization jointly decide on the appropriate measure concerning the two alternatives:

- Setting up a new tender
- Renegotiating with all suppliers in the tender to adapt the quotes to the new situation

The decision has to be documented in the tender documentation.

4.5 Contract approval (by the Sourcing Board)

Every sourcing activity with at least EUR 1m of value or equivalent has to be presented by the responsible purchaser in a Sourcing Board meeting to the members of the Sourcing Board prior to award of the contract. For this process step, regular Sourcing Board meetings are set up. The members of the Sourcing Board depend on the value of the contract and the type of spend (global or regional spend):

Value of contract	Type of spend	Members of the Sourcing Board
sourcing activity > EUR 5m	global	CPO, CoC Director Governance & Performance, respective CoC and BAP Director(s)
sourcing activity > EUR 5m	regional	CPO, CoC Director Governance & Performance, respective BAP Director(s)
EUR 1m < sourcing activity ≤ EUR 5m	global	CoC Director Governance & Performance, respective CoC and BAP Director(s)
EUR 1m < sourcing activity ≤ EUR 5m	regional	CoC Director Governance & Performance, respective BAP Director(s)

The members of the Sourcing Board have the right to pass on the presentation or to delegate the task within their group. If a contract has been approved by the Sourcing Board, then any subsequent call-offs do not require Sourcing Board approval again.

The standard documentation is stored on the Supply Chain/corporate procurement intranet and has to be filled in completely and correctly. The responsible purchaser has to submit this documentation at least 4 working days before the Sourcing Board meeting to the CoC Governance & Performance. It is the purchaser's duty to include this contract approval into the sourcing time plan to avoid actions on short notice.

A clarification which cases have to be presented to the Sourcing Board and where there are exceptions are detailed on the Supply Chain/corporate procurement intranet.

4.6 Contracting

The term "contract" in this Policy implies all different sorts of agreements with suppliers including purchase orders, frame contracts, (global) contracts, as well as call-offs.

Frame contracts are all sorts of agreements with suppliers with clearly defined specification including quantities and prices as well as a defined runtime. Frame contracts must be the result of a competitive tendering process and do not include an obligation to deliver goods or services, but set the frame for a future delivery. The call off with reference to a frame contract can be done, depending on the specifics of the frame contract, by the business or by the Supply Chain organization.

General agreements are contracts with suppliers which have not been tendered competitively and just build the basis of future collaboration. As the Supply Chain organization strives for tendering all external spend competitively, these general agreements do not build a base for call offs without competition. The individual need has to be tendered.

Every contract apart from the exceptions detailed in Appendices 01 and 02 has to be created in SAP. The Supply Chain organization has to ensure that existing frame contracts are used consistently. The responsible purchaser involves the legal department into the development of the contract, if required.

E.ON Conditions of Contracts shall apply to all contracts, irrespective of their value. The Supply Chain organization does not accept other companies' conditions unless left with no choice due to extraordinary circumstances. In this case, differing conditions have to be approved by the legal department, if the purchaser considers the deviation as considerable risk. CoC Governance & Performance keeps the E.ON Conditions of Contracts up to date. To take country-specific requirements into account, there can be E.ON Conditions of Contracts per country derived from the E.ON SE Conditions of Contracts.

The communication to the losing suppliers has to be done by the responsible purchaser.

Confirmations of contracts are requested above a threshold of EUR 25,000 or equivalent apart from call-offs. They have to be sent out together with the SAP contract to the supplier. Below this value, the responsible purchaser decides if he requests a confirmation from the supplier. Return of the signed confirmation must be followed up by the responsible purchaser (including follow up on potential deviations in the confirmation). For details, see Appendix 03.

4.6.1 Authorisation of Contracts

All Procurement contracts need to be authorized (via physical, electronic signature or via workflow-authorization) in line with local guidelines on delegations of Authorities. For the CoC Indirect Spend, a central guideline on Delegations of Authorities is available on the Supply Chain/corporate procurement intranet.

Levels of delegated authority do not change when demands are split in multiple requisitions / positions. Authorisation shall be asked for the maximum sum eventually due for goods and services contracted, irrespective of whether this is done via framework, call-off, or single contracts including contract extensions. A prerequisite for the authorisation of a contract above EUR 1m or equivalent is the contract approval, see chapter 4.5.

4.6.2 Variations Post Contract Award

Variations to contracts will only be done by the Supply Chain organization, unless the Supply Chain organization agrees otherwise, and shall be carried out in accordance with the conditions of the contract in close co-operation with the business responsible for executing the work. Verbal agreements are not permitted. Any variations have to be recorded in the tender documentation. Variations with at least EUR 1m of value or equivalent require Sourcing Board approval (see chapter 4.5).

The SAP contract has to be adjusted accordingly based on an approved requisition that covers the value of the variation. For details, see Appendices 03 and 04.

4.6.3 Contract Extension vs. Repetition

A contract can be extended once and for one year. If the Supply Chain organization decides to deviate from this principle (e.g. due to market reasons, a new tender would lead to a less favorable cost situation than an extension of the contract), than the respective HOP or CoC Director has to confirm this decision in writing and to store this confirmation in the tender documentation.

If a new demand arises with substantially the same characteristics as a tender performed less than one year ago, the results can be used without re-tendering (repetition).

Generally, the Supply Chain organization is responsible for taking a decision regarding contract extension or contract repetition. When in doubt, the HOP or CoC Director takes the decision.

4.6.4 Tender documentation

The tender documentation consists of the specification, the requests for quotation, the requests for information if applicable, all quotes returned as well as denials from suppliers, the evaluation, documentation of negotiation, all relevant correspondence,

all filled templates in the course of the tender and the contract including contract history. The tender documentation must be stored by the Supply Chain organization either physically in a traceable archive system or via optical archiving in SAP. Legal requirements of physical archiving can be addressed at a regional level.

4.6.5 Usage of eCatalogues

Where applicable, the Supply Chain organization has to set up e-Catalogues to secure lean processes and bundling effects in their respective categories. The requester is responsible for checking on the eCatalogue platform to fulfill the specific demand. If there is no catalogue in place, the requester issues an SAP purchase requisition if the expected value of the demand is above EUR 1,000 or equivalent. For details, see Appendix 02.

4.7 Contract management

The requester is responsible for following up on the delivery or service provision related to the contract and to confirm the delivery by setting the goods receipt in SAP (or confirming the service entry sheet in SAP). The Supply Chain organization shall provide support in the contract implementation and interpretation if required.

In case of a frame contract, the responsible purchaser has to follow up on the usage of the contract (checking amounts and time limits).

Only the Supply Chain organization is entitled to cancel or terminate contracts, irrespective of the value. The Supply Chain organization and the requester will jointly negotiate regarding potential cancellation fees with the supplier.

4.7.1 Claims Management

A claim is the request of one of the contracting parties (supplier or E.ON) caused by a deviation from the initial contract scope. Deviations can be caused by timeline changes, additional costs and/or other unexpected results. Neither pure quantity changes with defined unit prices nor additional requests made by E.ON on the scope nor contractual adjustments mutually agreed during contract execution are to be considered as Claims.

Claims Management is defined as all activities to reduce supplier’s opportunities to request a claim in the contracting phase and to effectively enforce own requests towards the supplier as well as push back unjustified requests from the supplier during contract execution.

The responsible purchaser has to make sure that all contracts with a value above EUR 1m incorporate a dedicated procedure on claims. A standard text passage is provided

in SAP (and on the Supply Chain/corporate procurement intranet) which shall be used as a standard clause where applicable.

If a supplier claims during execution of the contract (with a claim value above EUR 1m or equivalent), then the standard Claims Management Process has to be followed by the responsible purchaser or, if applicable, by the nominated Claims Manager. This is mandatory for all claims. Details are described in Appendix 06 ("Claims Management Handbook"). In this Handbook, the roles and responsibilities are defined as well as specific requirements for handling of claims in Major Asset Projects (projects above EUR 50m or equivalent).

CoC Governance & Performance, Corporate Claims Management, sets out the processes to be followed for claims as well as the respective responsibilities and closely aligns with the relevant purchasers and Claim Managers to support in upcoming claims (see Appendix 06 for details). In addition, Corporate Claims Management is responsible for the following tasks:

- Defining and driving best practice build up in the area of claims management and assure lessons learned are captured, reflected and applied
- Selective application of anticipatory claim management with regards to complex contracts
- Measuring the compliance with claims management related regulations as laid out in this policy and provide guidance and support in those related matters to the organization
- Recruiting and nomination of project claims managers in projects > EUR 50m or - on demand - in projects below EUR 50m
- Functional steering of the nominated project claims managers

For details, see Appendix 06, chapters 3 and 4.

4.8 Procure-to-Pay

The end-to-end process from the development of a demand from the external market to payment of the invoice is of utmost importance for both process security and efficiency. All involved parties have to ensure compliance with the process description with the following major parts:

- Definition of need/specification
- Early creation of a complete requisition in SAP
- Transparent set up of purchase orders in SAP
- Setting the goods/services received
- Highly automatized invoice processing

The GLOBE SAP principle "No purchase order no pay" applies, the only permitted exceptions are exclusively listed in Appendices 01 and 02.

In the Appendix 03 "SAP-Policy for purchasers", and Appendix 04 "Policy for the requester" the deliverables of the requester as well as the interface and the relevant process steps of Accounts Payables are defined.

Concrete thresholds for E.ON´s invoice verification can be found in Appendix 03 "SAP-Policy for purchasers".

4.8.1 Product/Service-Codes

Product/Service-Codes are a classification of spend categories used for two different purposes:

Automation of the routing process:
The requester classifies the requisition with an appropriate Product/Service-Code. The SAP system processes this purchase requisition automatically to the responsible purchaser in the respective Regional Unit Procurement. For details, see Appendix 04 "Policy for the requester".

Responsibilities of the purchaser to secure transparency of spend:
The Product/Service-Codes provide a basic structure for the Supply Chain organization to analyze spend. This spend analysis provides a foundation in supplier negotiations and spend governance.
For contracts which are set up including Supply Chain involvement, the responsible purchaser checks the Product/Service-Code provided by the requester and changes, in case of inaccuracy, the Product/Service-Code in the contract. For details, see Appendix 03 "SAP-Policy for purchasers".
The complete table of valid Product/Service-Codes is listed on the Supply Chain/corporate procurement intranet.

4.8.2 Payment terms

Group-wide harmonized payment terms have been developed in the Working Capital Excellence (WCE) project. The WCE Group Policy applies.
The Supply Chain organization is responsible to implement two measures whenever new contracts are negotiated:

- Payment term extension: The objective is to extend existing payment terms under economic considerations.
- End-of-Month (EOM) concept: Monthly payment shall be implemented where legally feasible.

Due to different local conditions and legal restrictions, two clusters of countries have been developed for standard payment terms:

Country cluster 1: Germany, UK, Romania, USA, Italy, Sweden, Poland and France

a) 45 days until the end of a given month (45EOM) -net-, due on the 5th of the following month
b) 15 days until the end of a given month (15EOM) less 2% cash discount, due on the 5th of the following month
c) due 15 days from invoice entry date less 3% cash discount

Note: In France the EOM conditions apply, however invoices are due at the end of the month, counted from invoice day.

Country cluster 2: Czech Republic and Hungary

a) due 60 days from invoice entry date paid in the weekly payment run
b) due 30 days from invoice entry date less 2% cash discount
c) due 15 days from invoice entry date less 3% cash discount

The new payment conditions, as described above, have to be applied wherever possible for all sourcing activities independent of the order volume.

In case the payment terms for new contracts deviate from the Standard Payment Terms, the deviating term has to be approved according to the Delegation of Authority (DoA) of the respective unit as part of the general PO approval process - for new contracts with contractual volume above EUR 1m additionally by the Sourcing Board.

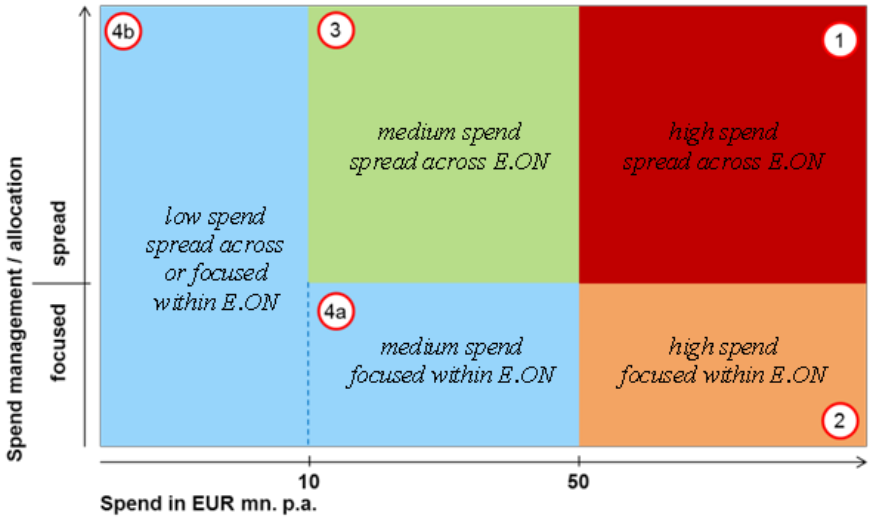
The payment term training document provides detailed information. In addition, the payment term evaluation tool (see Supply Chain/corporate procurement intranet) allows for evaluating offers after negotiation and supports the purchaser to select the best economic offer. In case of Sourcing Board relevant sourcing activities, the payment tool is part of the Sourcing Board presentation.

4.9 Management of suppliers

Management of suppliers within E.ON Supply Chain organization ranges around three essential aspects: Key Supplier Management (KSM), Global Sourcing and Supplier Relationship Management. All of these areas are closely linked into each other and address the following three essential objectives:

- increase E.ON's purchasing power across the group
- expand E.ON's supplier base into global markets with a special focus on emerging economies and markets
- make supplier performance, risk and development needs transparent, traceable and executable

To determine relevance and strategic positioning of E.ON's suppliers and to deploy adequate supplier relationship steering model, E.ON's supply base needs to be clustered along two major dimensions – procurement spend and spend allocation across E.ON.



Determination of Dimension "Spend":
Spend is considered as one of the two major dimensions needed to cluster E.ON's suppliers, taking spend of suppliers for the last four full years into account. Regarding thresholds of EUR 10m and EUR 50m p.a., the supplier spend has to be above the threshold at least in 2 out of the 4 analyzed years or in the previous year. The current analysis is based on purchase order volume only, herein referred to as "Spend".

Determination of Dimension "Spend management/Allocation":
Spend allocation considers the spread of spend and/ or management of a supplier, i.e. how concentrated or how fragmented the spend of a specific supplier is across E.ON. Spend can be focused either from a CoC perspective or a regional perspective into:

Focused Spend:

- At least 90% of spend with a supplier are covered within one CoC, and, in case of CoC Indirect or CoC Grid, at least 80% of spend are covered within one category, or
- At least 90% of spend with a supplier are covered within one Regional Unit

Spread Spend in this context is all other spend which is not focused.

4.9.1 Key supplier management

Key Supplier Management (KSM) within the CoC Governance & Performance actively manages and drives business relationships and supply base structures across E.ON. Therefore KSM will regularly assess the spend volume of E.ON and identify the Top 50 suppliers based on aggregated purchase order value in the previous four years.
Furthermore, KSM owns and executes the process of analyzing spend of E.ON's Top 50 suppliers and allocating them to the above explained clusters.
KSM will keep supplier clustering updated and provide with revisions on an annual basis.
Core processes conducted by KSM include:

- Analysis of an "Interims Report" to identify the spend and ranking of the Top 50 suppliers
- Determination of supplier spend characteristics (CoCs, categories, regions) to derive supplier clustering of Top50 suppliers
- Definition and execution of "Criticality Assessment" to determine "Key Supplier" status within Top50 suppliers
- Communication of results and implications to the Supply Chain organization Community
-

KSM takes on the leadership and responsibility of managing the relationships of E.ON's Key Suppliers among the Top 50 suppliers. These Key Suppliers are characterized by high spend and high criticality, and can be found predominantly in (but not limited to) clusters 1 and 2. Criticality is evaluated qualitatively considering aspects like strategic cooperation, market situation as well as performance and behavior of the supplier. Updates on the key suppliers are communicated by the CoC Governance & Performance on a regular basis.
Core processes for supplier management to be executed under the lead and responsibility of KSM for Key Suppliers contain:

- Spend Analysis
- Market Analysis & Supplier Strategy
- Supplier Intelligence Build Up & Maintenance
- Supplier Performance Measurement & Development
- Direct Supplier Management
- Relationship Steering

Further approaches and steering models for suppliers (Key and Non-Key Suppliers) will be communicated at a later stage.

4.9.2 Global Sourcing

Global Sourcing within E.ON is defined as the diagnostics, supply and supplier market assessment, supplier capability assessment and the management of suppliers outside E.ON's home markets. The focus of E.ON's global sourcing activities lies on markets outside the European Union as well as North America including the United States and Canada. E.ON aims to deliver substantial cost efficiency gains as well as build up and maintain global supply market insights to drive further cost, quality and security of supply.

The Global Sourcing process of E.ON ranks along the following major activities and processes:

- Global Sourcing Diagnostics
    - Baselining of procurement spend in focus, i.e. review of essential elements of the category strategies or identification of most relevant procurement data, such as but not limited to current and future spend, current suppliers and geographies, latest conducted supply market analysis, mid-/ long term Supply Chain/procurement strategy
    - Identification of cost structure on TCO basis of relevant products/ services and respective cost driver analysis
    - Combining of market and industry segment intelligence across global markets with key findings on the above
    - Derivation and high level assessment of global sourcing opportunities for respective products/ services and potential target markets

- Supply and Supplier Market Assessment
    - Based on key findings from Global Sourcing Diagnostics, initiation of detailed supply market assessment(s)
    - Further refinement of potential markets and development of key influencing external as well as internal factors on overall market attractiveness/ risk
    - Conduct supplier identification in highest ranked markets
    - Develop a first "long list" of potential suppliers and use RFIs to determine supplier capabilities to shorten supplier list

- Supplier Capability Assessment
    - The Supplier Capability Assessment comprises the Pre-Qualification procedures, Plant Audit executions and the follow-up on corrective actions. Further details are to be found in section 4.9.3

- Supplier Management
    - Support in qualification of suppliers into respective/ applicable tendering activities and active involvement of Global Sourcing in execution of

Procurement Cycle Process, including such elements as but not limited to, tender supplier panel, tender preparation, execution and negotiation
- Maintaining supplier relationship in close collaboration with affected Supply Chain and business functions as well as supplier performance evaluations and corrective action requests (if applicable)
- Continuous further screening and development of potential additional business opportunities across all Supply Chain functions

Depending on the level of global sourcing maturity within E.ON's categories, the CoC Governance & Performance, Global Sourcing, will deploy different approaches:

- DRIVE – if no global sourcing diagnostics/ analysis conducted in either global category strategies or in respective substantial regional category tender activities conducted lately, Global Sourcing will actively initiate the process and align closely with the responsible purchaser as well as the business functions
- JOINT: if global sourcing diagnostics/ analysis conducted in either global category strategies or reflected in lately conducted substantial regional tenders, Global Sourcing will align with the responsible purchaser and business functions and supports where needed
- CONSULT: if a global category or affected regional procurement unit already holds relationships with suppliers in global sourcing activities, Global Sourcing will align with the responsible purchaser and business functions on potential support models

4.9.3 Supplier relationship management

A consistent approach to Supplier Relationship Management is important to provide group-wide transparency on our suppliers and their performance. This is also crucial in order to ensure sustainability in the Supply Chain as sustainability is for E.ON an integral part to be taken into account in the key business processes. This is reflected in this policy by embedding all sustainability related topics as e.g. HSE and CR requirements towards suppliers in the relevant procurement processes. All this enables EON to prevent and/or mitigate risks connected to external spend, therefore maximizing the value of interactions with suppliers as well as to anticipate and manage sustainability risks and opportunities in an appropriate manner.

To ensure consistency, all purchasers strictly have to follow the defined process, to perform all parts of Supplier relationship management in every relevant case, to document the results correctly in E.ON´s supplier relationship management in GLOBE SAP, and to make the results accessible to the Supply Chain community.

Supplier qualification: This process part has been designed to ensure consistency in (a) which suppliers have to undergo qualification and (b) what exactly a supplier has to pass to successfully become an E.ON supplier. Hereinafter the cornerstones are described.

Every new external supplier, meeting one or more of the following conditions, shall be qualified:

- The expected annual purchase volume for materials exceeds EUR 500,000 or equivalent, or
- The expected annual purchase volume for services or combinations of products and services exceeds EUR 100,000 or equivalent, or
- Products or services - irrespective of the expected annual purchase volume - which have been marked by the business with a high or medium HSE risk.

The supplier qualification consists of several process elements (prequalification, product/service evaluation and testing, audit, trial order).
Each of the supplier qualification process steps is supported by a corresponding default document in order to generate results in a standardized way. Nevertheless, each of these default documents can be augmented (e.g. by extensions, such as additional questions) by the responsible purchaser, reflecting the variety of goods and services purchased by E.ON, of risks associated with the products and services as well as of locally applicable requirements (such as - without being exhaustive - safety regulations, work permits, certificates).

The successful completion of the prequalification process element (where the supplier fills in the prequalification questionnaire and the evaluation of the questionnaire reveals a score sufficient for passing) shall be mandatory for tender participation. Successfully passing all process steps leads to qualification of a new supplier.
Under certain conditions, some of these process steps can be by-passed.

The right of E.ON to perform re-qualification, unplanned audits, or visits without notification, to a supplier´s site should become part of the contract with the supplier where applicable. The results of each process step of a supplier´s qualification shall be stored within E.ON´s supplier relationship management.

Details about the E.ON supplier qualification are summarized in the “SRM Supplier qualification guidance document” (see Supply Chain/corporate procurement intranet).

Supplier risk assessment: Every supplier with an annual spend volume of more than EUR 5m or equivalent has to be assessed in the four risk dimensions Finance, Market, Corporate Responsibility / Compliance and Performance. The assessment has to be repeated every 2 years to confirm up-to-date information.

The purchaser actually dealing with the supplier is responsible for executing the assessment.

Details and templates can be found on the GLOBE eBook**.** The completed documents have to be stored on the GLOBE SAP.

Supplier evaluation: Every contract above EUR 500,000 or equivalent is selected by the GLOBE SAP-system for supplier evaluation to ensure a consistent approach in supplier relationship management. Lower thresholds can be implemented on country level. Besides this, both business and the Supply Chain organization can select additional contracts to be evaluated based on their experience and criticality of the purchase.

The evaluation has to be performed by the requester on the evaluation template provided on different dimensions with a rating from 1 (=excellent) to 5 (=insufficient).

In case of an insufficient rating, immediate actions for improving the supplier's performance have to be taken. The responsible purchaser and Quality Manager of the respective unit agree on the appropriate measures.

All performed supplier evaluations are stored in the GLOBE SAP, and are available for the whole Supply Chain community.

Supplier development: Individual measures arising out of identified gaps in supplier performance (identified in prequalification, supplier risk assessment or supplier evaluation) as well as improving performance of potential suppliers are driven by the Supply Chain organization and supported by the business. For more information on storing the documentation of supplier development measures please refer to the GLOBE eBook.

4.10 Controlling and Reporting

4.10.1 Definition and reporting of value/savings

Through various activities the Supply Chain organization can generate significant value for E.ON.

Beyond savings (financial cost reduction) the Supply Chain organization aims to make all kind of value creation transparent, although it cannot be monetized all the time.

Savings are financial cost reductions resulting from concrete measures/initiatives/ actions that decrease spend versus a previous price. Savings are calculated on the basis of prior year average prices, applying the current volume.

The spend reduction must be the consequence of the reduction of the unit price:

- either directly, e.g. unit price reduction through a negotiation or through a change to a cheaper supplier
- or indirectly through a value engineering activity; e.g., introduction of an SLA (Service Level Agreement) through which a more effective technical solution or process is implemented, to fulfil the same scope, same functional specifications but at a lower overall cost (see example in Appendix 03).
-

The calculation of the savings is performed based on the historical price. This should be last year's average price. In case multiple contracts relevant for this purchasing activity exist in parallel, the weighted average purchase price has to be used. The price difference between the average weighted previous price and the new price is multiplied with the new quantity in order to calculate the savings.

If there has been no contract in the last year, but it is a recurrent spend (e.g. every second year) the last relevant average purchase price can be considered as a reference. In case of recurrent spend projects driven, the determination of comparable spend is possible by using proxy such as costs KPI logic for example (e.g. stringing of overhead line cables in EUR per km).

In case no comparable historical price can be determined (e.g. in case of one-time purchases), there is no savings calculation possible. Cost avoidance, claim defence and reductions versus best offer do not fulfil the requirements of this definition.

Inflation effects as well as the development of volatile raw material markets are not considered, meaning that the historical price is not adjusted by indices. Price increases or “negative savings” (e.g. increased unit prices) have to be reported as well.

The financial impact of the savings must be recognisable in the financial statements (P&L, balance sheet). The savings can be reductions in Opex or Capex. This also includes spend reductions for activities funded by accruals.

The savings are reported on a regular basis.
For large multi-years Capex projects, a specific savings concept is to be developed.

Key drivers for additional value creation have to be further analysed and a respective reporting concept to be set up.
For further information about collection of the savings and value creation, please refer to Appendix 03.

4.10.2 Reporting (BI)

Supply Chain/Procurement reports are key elements for steering purposes and to increase spend transparency.

The Supply Chain organization has specific reports to steer its business. The reports for units using GLOBE SAP and units not using GLOBE SAP differ. Units which already implemented GLOBE SAP can retrieve their data from the GLOBE SAP System and the Business Intelligence (BI).

Details and training materials can be found in training material "P2P for Purchaser". BI reporting contains Supply Chain/procurement reports for purchase orders/contracts, purchase requisitions, logistic and service orders, material stocks and movements. The basis of all reports is the master- and movement data of the Supply Chain organization and Logistic. BI provides a standard reporting, which is built on a general, standardized database. For detailed information about the different reports see the GLOBE eBook.

There is a harmonized reporting process for all GLOBE SAP reporting units. For these units, the relevant procurement data is centrally taken from GLOBE SAP reports in the BI on the first working day after quarter-end. The CoC Governance & Performance then sends the downloaded data to the reporting unit to be checked for potential inconsistencies.

All non-GLOBE SAP reporting units have to report the predefined procurement data to the CoC Governance & Performance in a predefined template.

All units are responsible for the accuracy of their spend data in GLOBE SAP and compliance with this policy (e.g. correct handling of exceptions).

5 Special regulations

5.1 Customer solutions: Procurement for "New Solutions" business & ":agile"

5.1.1 Scope

Through the new strategy, E.ON is planning to massively increase its business activities outside its established business fields such as Grid and Renewables. The new Customer Solutions segment is expected to grow strongest on relative terms over the next years. Within the Customer Solution segment the Commodity as well as the Heat Business areas are already established business fields – in contrast, the "New Solutions" business area is relatively new and approaches new markets, utilizes new technologies, offers new customer value. While a large part of the customer solution products and services for these new activities can be procured through our standard processes, the Supply Chain organization fully acknowledges that there will be an increasing number of cases that may require a different (i.e. faster decision making) approach.

In order to support the necessary growth and success in the "New Solutions" business area, there is a special procedure for these cases (see following examples) where even

through early involvement of the Supply Chain organization the core procurement processes as described in Chapter 4 cannot be followed stringently.

1. **Example "dependence on non-qualified supplier":**
   It could be that a 3rd party determines the use of any given supplier which has previously not worked for E.ON and that the timeline of the project would not allow a standard qualification process. Examples could be that project rights are linked to suppliers or that customers request the use of certain suppliers. Here the risk that this supplier is not working to our standards on health, safety and environmental aspects has to be covered through other means and agreed jointly together with colleagues from Sustainability & HSSE, to ensure that business opportunities shall not be lost.
2. **Example "dependence on non-compliant supplier":**
   It could be that a project dependents on products or services from a specific supplier, but that we have noticed non-compliant behavior to our standards from that specific supplier (but which might be in line with local legislation). In these cases an assessment of the trade-offs between business opportunity and potential risks for E.ON as an entity has to be made.
3. **Example "Selling of 3rd-party branded products":**
   It could be that we are asked by our customers to provide additional 3rd-party products or services in conjunction with our offerings, but that we either lack on time to tender for these products or services or that a specific brand is requested. In this case the risk to overpay due to no competition has to be managed as stringent as possible within the given constraints of the project.

5.1.2 Process

In order to ensure the necessary speed and agility in the sourcing process, which might be crucial to keep the Business Opportunity, a special "fast-track procedure" can be started by the requester in close alignment with the responsible purchaser. The requester needs to provide the following information via using the mandatory special procedure template (details see Supply Chain/corporate procurement intranet) to the responsible purchaser:

- Scope and background of the project/activity
- Reasons for applying Procurement procedure for "New Solutions"
- Benefits, value contribution, identified risks and proposed risk mitigation plan of project/activity

For each request an authorization and signing by Business (Responsible board member, Managing Director or Vice President Group Management), by Supply Chain organization (CoC/BAP Director) and e.g. in case of deviations from Sustainability or HSE regulations in addition by Sustainability & HSSE (Group Sustainability & HSSE or HSE manager of impacted unit) is required. Furthermore in case of IT-based solutions with a potential risk to IT-security an authorization by the CIO-organization is needed.

Based on the scope of the project/activity the requester and the purchaser have to define the respective responsible persons and send them the template for approval via email. After the request has been raised approval of all involved parties has to be granted at short-notice by real signature or confirmation via email. In case that the template has all relevant information, the maximum time to react from the responsible Supply Chain person should be 48 hours.
In the event of not-aligned assessments of the situation from the relevant Business, Supply Chain, Sustainability & HSSE and/or CIO (if applicable) a fast-track escalation should be done via the requester's organization and via the functional organizations - Supply Chain, Sustainability & HSSE and/or CIO (if applicable) - in order not to endanger the Business Opportunity.

The purchaser is responsible for the documentation. The result (template including approvals of all involved parties) has to be archived with the overall contract documentation in SAP and has to be handed in to CoC Governance & Performance via the email account: procurement-processes@eon.com.
CoC Governance & Performance centrally documents all cases raised and reports at the end of each quarter.

5.1.3 ":agile"

The ":agile" accelerator is an open innovation hub that supports both internal and external people with bright ideas in realizing their business ideas and developing market-compatible business models.
As these projects are conducted by small teams in start-up like character, fast decision making is necessary to evolve the business ideas quickly into higher degrees of realization. To allow this needed entrepreneurial freedom, projects running in the :agile accelerator are excluded from the procurement processes and support of the Supply Chain organization (see Appendix 01 "Exception list").
If an :agile project still would like to get support, the Supply Chain organization will try to support based on availability of resources and potential value add.

5.2 Procurement of Goods and Services from internal suppliers

For the procurement of goods and services from internal suppliers special rules are in place to secure an efficient and reliable process. For details, see Appendix 05.

5.3 Procurement of Management Consulting

For the procurement of Management Consulting Services a Make or Buy analysis whether ECON can execute the project is to be performed before the engagement of external advisors.

5.4 Procurement of Temporary Labour

For the Procurement of Temporary Labour existing unit-specific processes need to be considered beside the standard procurement process. The approval of the works council has to be obtained by the demand carrier based on the local regulation.

5.5 Other purchasing processes

The following purchases can be executed by the requester on E.ON internal platforms directly:

Travel bookings for E.ON employees are done by the respective employee via the myHR platform. The travel Policy GP 3-29 applies.
Trainings and seminars for E.ON employees have to be exclusively booked by the respective employee via the HR learning platform and the Academy Online platform on the intranet (link). Bookings outside these platforms are not allowed.
Only in case a special requirement cannot be covered by an internal training offer, it is possible to take part in an external course (open enrolment). In this specific case the employee contacts HR EBS Global learning via HR.Online and uses the respective e-form. Bookings of internal and external courses outside these platforms are not allowed. HR EBS uses existing framework agreements to deliver these trainings. Sourcing for new or customized courses is led by the Supply Chain organization in collaboration with HR CoC Global Learning.

Exceptions are those units that are not serviced by HR EBS (E.ON Business Services, Berlin) and those not part of HR TOM. For these units, the regular procurement process applies.

Available frame contracts are listed on the Supply Chain/corporate procurement intranet.

5.6 Procurement on behalf of a third party

If procurement activities are conducted fully on behalf of a third party/third parties with specific requests on the choice of sub-suppliers or specific product requests, then the Supply Chain organization can purchase the requested goods or services without tender procedure. This only applies in case the full costs are borne by the third party and given that such purchase does not counteract E.ON minimum standards on HSE or CR or incurs another temporary or permanent risk to E.ON. Documentation of these cases must be done in the tender documentation.

6 Entering into Force

This Policy shall enter into force on February 15th, 2016 and remain valid until February 14th, 2018.

7 Glossary

7.1 Communication / Information

All documents and forms available for the whole Supply Chain organization are listed on the Supply Chain /corporate procurement intranet.

Within the Supply Chain organization and for all E.ON staff involved in sourcing activities, the Supply Chain/corporate procurement intranet contains all available information and relevant links to procurement tools.
In addition information exchange in the Supply Chain organization is fostered via regular Supply Chain leadership meetings and category manager conferences, regular Supply Chain leadership telephone conferences as well as a Supply Chain/Procurement Newsletter.

Supply Chain leaders must ensure that their respective staff is regularly updated.

7.2 Appendices

Appendix 01: Exception list

Appendix 02: Small volume orders

Appendix 03: Policy for purchasers

Appendix 04: Policy for the requester

Appendix 05: Internal Suppliers

Appendix 06: Claims Management Handbook

Appendix 07: HSE Risk Identification within the Procure-to-Pay process

7.3 Definitions

Claims management:	A claim is the request of one of the contracting parties (supplier or E.ON) caused by a deviation from the initial contract scope. Deviations can be caused by timeline changes, additional costs and/or other unexpected results. Neither pure quantity changes with defined unit prices nor additional requests made by E.ON on the scope nor contractual adjustments mutually agreed during contract execution are to be considered as Claims.
Contract:	Covers all sorts of documents for the purchase of goods and services (e.g. Frame order, purchase order, frame contract, order).
Demand:	Goods, services and other contracts purchased from third parties for the purpose of carrying out E.ON business.
eCatalogue:	E.ON procurement tool allowing the acquisition of goods and services through an electronic medium based on electronic catalogues.
Evaluation:	The combined results of the technical/subject specific content review and the commercial review determining which offer

	provides best value for money for the lowest total cost of ownership.
Frame contract:	Frame contracts are all sorts of agreements with suppliers with clearly defined specification including quantities and prices as well as a defined runtime.
General agreement:	General agreements are contracts which have not been tendered and only build the frame of collaboration between the supplier and E.ON
Global Category:	Supply Chain/Procurement Category which is centrally steered by a CoC.
Imminent Danger:	The situation in which (A) immediate actions are required to prevent a serious HSE related incident or (B) to prevent the business from significant harm, i.e. loss of an asset or significant loss of production.
Maverick buying:	Purchases without proper involvement of the Supply Chain organization.
Non-disclosure agreement:	Agreement between E.ON and a third party to secure that no E.ON-internal knowledge can be passed on by third parties.
Procurement/Supply Chain:	The E.ON Support Unit Supply Chain responsible for the acquisition of goods and services from external as well as internal suppliers.
Quote:	The quote handed in by a supplier (synonym to offer, bid, proposal).
Request for information:	Request that is sent to third parties to gather information on capabilities of suppliers.
Request for quotation:	Request that is sent to third parties specifying the demand and the frame conditions and inviting the third parties to tender.
Requester:	E.ON Employee or department raising a requisition (also referred to as demand carrier).
Requisition:	SAP requisition used to start the procurement process leading to the purchase of goods and services.
Sensitive Data:	Sensitive data is data that needs to be protected, as it includes private information on suppliers. This data can only be used and retrieved under restricted circumstances. Usually this includes the voluntary, written consent of the respective person.
Sourcing activity:	Any procurement activity which leads into a contract with a supplier.
Specification:	The service or product description. A functional specification is a clear indication of the purpose, function, application and performance expected of the supplied material or service, whereby the supplier is allowed or encouraged to provide an

	appropriate product.
Supplier:	Any external and internal provider (synonym to vendor, contractor).
eSourcing platform:	The Synertrade platform used for the tender approval and tender process.
Total cost of ownership:	Total cost of ownership (TCO) is a method to determine the direct and indirect costs of a project over its expected operational lifetime.

7.4 Abbreviations

BAP	Business Area Procurement
BI	Business Intelligence
CFO	Chief Financial Officer
CoC	Center of Competence
CPO	Chief Procurement Officer
DoA	Delegation of Authority
EBP	Enterprise Buying Portal
GP	Group Policy
HOP	Head of Procurement
HSE	Health, Safety & Environment
KPI	Key performance indicator
KSM	Key Supplier Management
PO	Purchase order
RFI	Request for Information
RFQ	Request for Quotation
SRM	Supplier Relationship Management
TCO	Total Cost of Ownership

5.3. Annex 3 – Questionnaire for the Evaluation of potential subcontractor

This project has received funding
from the European Union's Horizon 2020
research and innovation programme under
grant agreement n°731289

Anforderungsschwerpunkte	
Gesetzliche Rahmen und Gremien Vorgaben	
Der Erfolg der Energiewende steht in Abhängigkeit einer intelligenten Vernetzung von Systemen und Akteuren, Das Gesetz zur Digitalisierung der Energiewende (GDEW) regelt die technischen und rechtlichen Grundlagen und das BSI legt die Standards zur technischen und organisatorischen Durchsetzung von Datenschutz, Datensicherheit und Interoperabilität. im GDEW sowie in den technischen Richtlinien TR03109 und in den Fachgremien, wie FNN und BDEW werden zurzeit an entsprechenden Verfahren und Abläufen gearbeitet. Beinhaltet der angebotene Smart Grid Hub mit seinen Komponenten (SMGW und Steuerbox) schon die aktuellen Stände?	M
Wird der SGH die technische Richtlinie TR03109 in der aktuellsten Fassung unterstützen?	M
Wie wird das Interimsmodell im Projekt umgesetzt und wie sieht die Transformation ins Zielmodell aus? Das SMGW muss ja updatefähig auf das Zielmodell sein, gilt das auch für die Steuerbox?	M
Wie wird das BDEW Ampelkonzepts und dem FNN Hinweis zur Koordinierungsstelle im Smart Grid Hub berücksichtigt?	M
Wird der aktuelle FNN Stand des Lastenheftes zur Steuerbox berücksichtigt. Sind Sie aktiv im FNN zu diesem Thema tätig?	M
Investitionssicherheit	
Wird eine SOA Architektur eingesetzt ?	M
Wird eine modulare Architektur verwendet, welche eine flexible Erweiterung von Funktionen ermöglicht?	H
Können neue Funktionen durch eine Parametrierung durch EON-Mitarbeiter realisiert/konfiguriert werden?	M
Performance	
Ist parallel zum Datenaufbau der Regelbetrieb möglich (z.B.:Durchführen von Schalthandlungen bei schon vorhandenden iMSys)?	H
Wie stellen Sie sicher, dass Schalthandlungen parallel verarbeitet werden können?	M
Wie viele parallele CLS Kanäle können Sie aufbauen?	M
Können Messreihen als Massendaten für 200 Anlagen und einem Übertragungs-Intervall von bis zu 1min im SGH verwaltet werden?	M
Für die Netzleitstellen Berechnung werden mehrere Verbindungen zu den iMSys aufrecht erhalten, um max. alle 1 Minute Messwerte der Netzleitstelle zur Verfügung zu stellen. Kann der SGH dies für das Projekt leisten?	M
Mehrere eingehende Schwellwertverletzungen müssen parallel bearbeitet und analysiert werden. Kann der SGH bei parallel eingehenden Schwellwertverletzungen dem jeweiligen Stammdatensatz (iMSys) zuordnen und nahe real-time verarbeiten?	H
Auf Basis der Schwellwertverletzungen müssen statistische Kennwerte aggregiert werden. Kann der SGH dies in "nahe real-time" bewältigen?	H
Die aggregierten Kennwerte müssen für die weitere verarbeitung in dem Regelwerk weiter verarbeitet werden und ggf. gespeicherte Szenarrien auslösen/starten. Kann der SGH dies in nahe real-time?	H
Systemverfügbarkeit	
Können redundante Systemlandschaften zwecks der Ausfallsicherheit betrieben werden?	H
Wie wird die Synchronität mehrerer beiden Systeme gewährleistet?	M
Wie sind die Rahmenbedingungen für Systemumschaltungen umgeschaltet?	L
Sind in der Applikation Mechanismen zur Ausfallsicherheit vorgesehen?	M
Sind in der Applikation Mechanismen zum Wiederaufbau eingeplant?	L
Schnittstellen	
Anbindung einer Integrationsplattform (z.B. SAP PI) per HTTPS	H
Implementierung von Webservice Aufruf per SOAP	M
Sind alternativ individuelle Schnittstellen zu externen Applikationen zwecks Übernahme und Anpassung der Stammdaten vorhanden ?	M
Ist die manuelle Erfassung und Änderung der Stammdaten möglich	KO

Wie wird die Netzleitstelle von PSI angebunden? Existiert hier eine Lösung bzw. Umsetzungskonzept?	KO
Wie wird die bidirektionlae Schnittstelle zur Netzleitstelle realsiert?	H
Ist in der Schnittstelle von/zu den Netzleitstellen eine semantische und eine syntaktische Prüfung vorhanden?	M
Wie werden Ablehnungen oder nicht ausgeführte Befehlssätze der Netzleitstelle rückgemeldet?	L
Wie können über diese Schnittstelle die Schwellwertverletzungen vom SGH zu den Netzleitstellen übermittelt werden?	M
Wie werden Fehler auf der Schnittstelle gemeldet bzw. weiter verarbeitet?	M
Schnittstelle aktiver EMT	
Funktion TLS-Kanal anfordern: Ist eine Prüfung, ob ein TLS-Kanal zum spezifischen iMSys, implementiert?	M
Funktion TLS-Kanal anfordern: Ist eine Funktion vorhanden, die Informationen für die Anforderung "TLS-Kanal Aufbau" zusammenstellt?	KO
Funktion TLS-Kanal anfordern: Werden Rückmeldungen vom GWA zum SGH ausgewertet?	H
Funktion TLS-Kanal anfordern: Ist die Anbindung an das GWA-System der Fa. Siemens vorhanden?	H
Funktion Kommunikationsaufbau HES: Kann im TLS Kanal zwischen SGH und Steuerbox das Protokoll IEC61850 gefahren werden	KO
Funktion Kommunikationsaufbau HES: Können in den TLS Kanälen zwischen SGH und den Steuerboxen unterschiedliche Protokolle gefahren werden?	L
Zeit synchronisation: Wird Zeitsynchronisation unterstützt?	H
Berechtigungen	
Können übergeordnetete Berechtigungsgruppen erstellt werden?	L
Kann über die Berechtigung gesteuert werden, ob Regel-, Steuer- Befehle ausgeführt werden dürfen?	L
Kann über die Berechtigung gesteuert werden, ob SGH-Funktionen ausgeführt werden dürfen?	L
Kann über die Berechtigung gesteuert werden, welche Auswertungen oder Reports der NLS zurück gemeldet werden?	L
Funktionen "allgemein"	
Steuerbox Störung melden: Werden zukünftige Entwicklungen der Steuerbox bezüglich Störungsmeldung der Steuerbox unterstützt?	H
Stellt das System SGH alle Schaltzeiten täglich und anlagenscharf bereit?	KO
Schalten mit Zeitinterval-Funktion: Ist eine Timerfunktion für Schaltvorgängen geplant?	M
Netzzustandsdaten anfordern/empfangen: Können Netzzustandsgrößen vom SGH angefordert werden?	H
Netzzustandsdaten anfordern/empfangen: Können Netzzustandsgrößen vom SGH empfangen und iMSys spezifisch gespeichert werden?	H
Funktion „Anlegen und Zuordnen von Gruppen“	
Ist eine klassische Gruppierung (Gruppe inkl. Gruppennamen mit vielen dazugehörigen Anlagen) vorhanden?	KO
Können diese Gruppen automatisiert über Attribute beim Aufbau der Stammdaten erstellt werden?	H
Können diese Gruppen manuell über ein Front End pro Mandat gepflegt werden?	M
Können Gruppen zu einer übergeordneten Gruppe zusammengefasst werden, sodass eine Hierarchiestruktur einsteht (Unterordnung mehrerer Gruppen unterhalb einer übergeordneten Gruppe)?	M
Wie viele Hierachieebenen können realisiert werden?	M
Können einzelne Anlagen bzw. Gruppen auch mehreren (verschiedenen) Gruppen zugeodnet sein?	M
Kann eine Gruppierung über Attribute der Anlagen erfolgen?	M
Wenn über Attribute gruppiert wird, kann es Attribute geben, die eine Gruppe von Anlagen ausschliesst?	M
Kann eine Anlagengruppe für Schalthandlungen durch Messergebnisse bestimmt werden?	M
Wie wird die Struktur der Gruppen (Zuordnung der Anlagen und Gruppen untereinander, Hierarchie, Ebenen) dargestellt?	M
Können Messwerte bzw. Rechenwerte einzelner Anlagen oder einer Gruppe von Anlagen direkt in der Darstellung der Struktur der Gruppen eingesehen werden?	M
Wird es möglich sein, die Flexibilität der Gruppe automatisch zu berechnen und bereitzustellen, sofern der Benutzer es verlangt?	M
Funktion „Messen“	
Funktion „Messen“: Verlaufen die Messungen nach den Vorgaben der technischen Richtlinie (TR03109-1)?	H

Funktion "Messen": Die verbauten SMGw geben die Möglichkeit der Messung von Spannung, und Leistungswerten Werden diese Messungen durch die Funktion "Messen" im SGH abgedeckt ?	M
Funktion "Messen": Die verbauten SMGw geben die Möglichkeit der Messung weiterer Messwerte wie Strom, Phasenverschiebungen etc. Welche Messwertarten werden durch die Funktion "Messen" im SGH abgedeckt ?	M
Funktion "Messen": Besteht die Möglichkeit der Messung von Messwerten mehrerer Anlagen innerhalb einer oder mehrerer Gruppen?	M
Funktion "Messen": In welchem Abfrageintervall sind die Messungen im Rahmen dieses Projektes möglich? (Angabe in Sekunden)	M
Funktion "Messen": Gibt es neben der Befehlsart die Messung zu starten oder zu beenden die Option einer Gültigkeitsdauer des Messvorgangs (z.B. Vorgabe des Messvorgangs in Minuten)	M
Funktion „Schalten“ (Kapitel 3.5.3)	
Funktion "Schalten": Schalthandlung auslösen: Können Schaltbefehle an eine Steuerbox übertragen werden?	KO
Funktion "Schalten": Schalthandlung auslösen: Ist die Schaltung über einen Direktbefehl über das Protokoll IEC61850 an die Steuerbox möglich?	M
Funktion "Schalten": Besteht die Möglichkeit der Schaltung mehrerer Anlagen innerhalb einer oder mehrerer Gruppen?	H
Funktion "Schalten": Übertragung Schaltzeiten: Ist die Erstellung, Übertragung, Aktivierung und Ausführung eines Fahrplans vom SGH bis zur Steuerbox möglich? Werden zukünftige Entwicklungen der Steuerbox bezüglich der Übertragung von Schaltzeiten (Nachtspeicherheizungen) unterstützt?	M
Funktion "Schalten": Schalthandlung auslösen: Können Geräteeigenschaften (Aus, An, 100%, 60%, 30%) an eine Steuerbox mit potentialfreien Schalter übertragen und geschaltet werden?	KO
Funktion "Schalten": Schalthandlung auslösen: Können Geräteeigenschaften (Aus, An, 100%, 60%, 30%) an eine Steuerbox mit dierekter Schnittstelle zum Steuergerät der Anlage übertragen und geschaltet werden?	M
Funktion „Regeln anhand von Leistungswerten oder Relativwerten“	
Funktion „Regeln anhand von Leistungswerten oder Relativwerten“: Ist die Vorgabe von Zielwerten sowohl als prozentuale als auch als absolute Veränderungen (% oder kW) für eine oder mehrerer Gruppen möglich?	KO
Funktion „Regeln anhand von Leistungswerten oder Relativwerten“: Wird in diesem Fall nach Einspeise- und Lastleistung (Ausspeiseleitung) unterschieden?	H
Funktion „Regeln anhand von Leistungswerten oder Relativwerten“: Beschreiben Sie knapp, wie der Schaltbedarf möglichst effektiv umgesetzt wird! Gibt es eine Ab- bzw. Zuschaltreihenfolge der Anlagen? Wenn ja, nach welchen Kriterien? Wieviel Zeit vergeht zwischen den Regelungszyklen - ist diese variabel bestimmbar? Was geschieht mit Anlagen, die nicht erreichbar oder gestört sind? Wie wird auf eine erfolgreiche/nicht erfolgreiche Umsetzung der Regelung hingewiesen? usw.	
Funktion „Reduktionsstand ermitteln“	
Funktion „Reduktionsstand ermitteln“: Besteht die Ermittlung von Reduktionsständen (Relaisstellungen) von Anlagen einer oder mehrerer Gruppen über das Protokoll IEC61850? Werden diese mit Datum und Uhrzeit im SGH anlagenbezogen hinterlegt?	H
Funktion „Flexibilität ermitteln und bereitstellen“ (Kapitel 3.5.6)	
Funktion „Flexibilität ermitteln und bereitstellen“: Stellen Sie knapp ein Konzept dar, wie Sie die (theoretische) Flexibilität einer gewählten Gruppe ermitteln und bereitstellen!	H
Funktion „Flexibilität ermitteln und bereitstellen“: Halten Sie bereits im Rahmen dieses Projekts eine Berechnung/Abschätzung der praktisch nutzbaren Flexibilität für machbar (s. Lastenheft Kap. 9)? Wenn ja, wie wird die diese Berechnung/Abschätzung umgesetzt? Kann durch einen Sicherheitsfaktor die praktisch nutzbare Flexibilität näherungsweise abgeschätzt werden? Dieser kann entweder gestützt durch weitere Informationen (z.B. Wetterdaten) oder manuell gesetzt aus Erfahrungswerten hervorgehen.	M
Funktion „Schwellwerte im Netz setzen und empfangen: Aggregation und Meldung Netzzustandsdaten“ (Kapitel 3.5.7)	
Funktion „Schwellwerte im Netz setzen und empfangen: Aggregation und Meldung Netzzustandsdaten“: Können Schwellwertvorgaben als Stammdaten vom SGH iMSys spezifisch gespeichert werden?	H
Funktion „Schwellwerte im Netz setzen und empfangen: Aggregation und Meldung Netzzustandsdaten“: Ist eine Überwachungsfunktion der Schwellwertübertragung implementiert?	H
Funktion „Schwellwerte im Netz setzen und empfangen: Aggregation und Meldung Netzzustandsdaten“: Können Schwellwertverletzungen von iMSys vom SGH empfangen werden?	H

Funktion „Schwellwerte im Netz setzen und empfangen: Aggregation und Meldung Netzzustandsdaten“: Können eingehende Schwellwertverletzungen online statistisch verarbeitet werden, um daraus ab einer bestimmten Grenze weitere Aktionen zu starten (statistischer Filter)?	KO
Funktion „Ermittlung, Berechnung und Bereitstellung von Summen-, Durchschnitts- und Extremwerten in Gruppen“ (Kapitel 3.5.8)	
Funktion „Ermittlung, Berechnung und Bereitstellung von Summen-, Durchschnitts- und Extremwerten in Gruppen“: Können Summen-, Durchschnitts- und Extremwerte von Leistungs-, Spannungs- oder Stromwerten von Anlagen einer Gruppe gebildet werden?	H
Kann auf Basis der einströmenden Messdaten erkannt werden, wann für eine definierte Anlagengruppe ein vollständiger Messwertsatz vorliegt?	M
Kann auf Basis der erkannten Vollständigkeit in nahe real-time die Summen und Durchschnittsbildung erfolgen?	M
Funktion „Skalierung von Messwerten“	
Funktion „Skalierung von Messwerten“: Ist eine Skallierung der Messwerte möglich, sodass diese in weiteren Prozessen als überhöhte Messwerte verwendet werden können? Ist der Skallierungsfaktor sowohl für jede Gruppe einzeln als auch global für alle Gruppen einheitlich bestimmbar?	M
Funktion „CLS Schaltkanal bereitstellen“	
Wie stellen Sie sicher, dass Schalthandlungen parallel verarbeitet werden können?	M
Wie stellen Sie sicher, dass wichtige Schaltvorgänge vor den Unwichtigen durchgeführt werden? (maximal eine halbe Seite Konzept)	H
Wie viele CLS Kanäle können parallel geöffnet/verwendet werden?	L
Durch die Funktion "CLS Schaltkanal bereitstellen" sollen im Vorfeld ein CLS-Kanal bzw. mehrere CLS-Kanäle vorsorglich geöffnet werden, um bereits bekannte oder sehr wahrscheinliche Schaltvorgänge zu beschleunigen. a) Wie stellen Sie sicher, das durch diesen Prozess wichtige Schaltvorgänge nicht verzögert/unterbrochen werden? b) Wie stellen Sie sicher, dass die Bereitstellung nicht für eine zu lange/unangemessene Zeit Kanäle blockiert (z.B. durch Fehleingabe des Benutzers)? c) Erwarten Sie durch diese Maßnahme eine deutliche/mäßige/geinge/keine Performanceverbesserung hinsichtlich der Schaltvorgänge und warum?	M
Monitoring	
Status Monitoring: Hat der SGH ein Statusmonitoring für Administratoren?	KO
Status Monitoring: Werden Informationen über geöffnete TLS Verbindungen, wie z.B. Anzahl und deren Nutzungsart monitort?	M
Alarm Monitoring: Werden Administroren über kritische Fehler per Nachrichtenservices informiert?	L
Alarm Monitoring: Welche Nachrichtenservices kann der SGH bedienen (E-Mail, SMS, oder andere Informationskanäle)?	L
Event Monitoring: Gibt es ein Ende zu Ende (Vom Initierungsbefehl der Netzleitstelle bis zur Erfolgreichen positiven Rückmeldung der Schaltausführung) Monitoring?	L
Event Monitoring: Kann man für die Ende zu Ende Überwachung Time Outs für abgebrochene Schalthandlungen festlegen?	L
Datenbank	
Werden im SGH Open Source Datenbanken eingesetzt ?	H
Welche Skalierbarkeit erlauben die Datenbanken? Welcher Aufwand ist für eine Erweiterung notwendig?	H
Wieviele Steuerboxen können maximal im SHG verwaltet und gesteuert werden?	L
Archivierung	
Gibt es eine Standard-Schnittstelle zum einen Archivsystem?	M
Sind automatisierte Workflows zwecks Archivierung möglich?	L
Datensicherheit	
Wie erfolgen die Verbindung von und zum SGH? Werden nur sichere Verbindungen verwendet? Wie erfolgt die Absicherung der einzelnen Verbindungen?	H
Wie erfolgt die Authentifizierung, z.B. Benutzername und Passwort (LDAP) oder Token (SAML 2.0)?	L
Kann die Benutzerverwaltung /-steuerung über EIDM erfolgen?	L
Wie wird die Sicherheit der Daten auf dem SGH gesorgt (verschlüsselte Speicherung)?	L
Wie wird die Verfügbarkeit sichergestellt, z.B. Cluster (Load-Balancing), Backup-SGH (Hot-Standby / Warm-Standby)?	M
Erfolgt die Datenspeicherung in einer standardisierten Form (z.B. XML)? Wird auch für die Backups eine standardisierte Form verwendet?	M

Wie sind die Entwicklungs- / Test- / Deploymentprozesse definiert? (Auswertung der Ergebnisse, Reaktion auf gefundene Fehler/Schwachstellen)	L
Gibt es ein Rechtemanagement für die Entwicklung?	L
Existiert eine klare Rollen- und Personentrennung für Tätigkeiten einzelner Bereiche? Z.B. Benutzerrechteanfrage - Benutzerrechtevergabe	L
Infrastruktur (Kapitel 2.1)	
Kann neben dem on premise Model ein SaaS Model angeboten werden?	M
Wird bei einem SaaS Model die komplette Infrastruktur inklusive der Schnittstellen laut der Leistungsbeschreibung angeboten?	H
Wird bei einer on premise Lösung die dedizierte Hardware, die E.ON beizustellen hat beschrieben?	H
Wird der SGH in einem dreistufigen Konzept (Entwicklungs-, QS- und Produktivsystem) angeboten ?	H
Gibt es ein Konzept, um in das QS System und das Entwicklungssystem des SGH, ausgewählte Stammdaten intelligenter Messsysteme der E.ON zu übernehmen?	H
Gibt es einen Plan für das Transportmanagement von Updates und Patchen vom Entwicklungssystem zum QS-System zum produktiven System?	M
Gibt es eine Planungen wie zusätzliche Projektsysteme oder Schulungssystem in die Systemllandschaft aufgenommen werden können?	M
Wartung und Support	
Kann die Wartung und der Support gemäß der Vertrag angeboten werden?	H
Wird für den Betrieb auf Seite des Anbieters ein ein 3rd-Level Betrieb mit den geforderten Zeiten zur Verfügung stehen?	H
Application Lifecycle Management	
Ist ein Application Lifecycle Management integriert?	M
Wird im Betrieb der Applikation vom Anbieter ein Ansprechpartner bezüglich des Application Lifecycle Management bereit gestellt?	L

5.4. Annex 4 – Final tender evaluation matrix

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Angebotsbewertung

I) Summary

Anbieter		Schulnote Terms&Conditions	Schulnote Fachlich / IT-Aspekte	Schulnote Gesamt
PSI		0,00	0,63	0,63
EFR		0,00	0,63	0,63

Anmerkung zum Ausfüllen:
Es werden die Schulnoten 1 - 6 in den gelb markierten Feldern eingetragen.
In den Spalten neben den gelben Feldern (ausgeblendet) liegen die Berechnungsformeln

	PSI		EFR	
Kaufmännisch	0,00		0,00	
Legal	0,00		0,00	
Data Privacy	0,00		0,00	
Fachlich	2,84		2,10	

Fazit Entscheidung

II) Bewertungsdetails

100%

I) Kaufmännische und juristische Bewertung / Summary aus Vertragsunterlagen				Gewichtung	PSI			EFR		
lfd. Nr.	Referenz-Sektion	Kategorie	Kriterium		Angebots-Bewertung	Schul-note		Angebots-Bewertu	Schul-note	

												ng		
1		***Preis gemäß TCO***				Note 1 - Note 6		55%						
								100%		**0,00**			**0,00**	
		Haftung, Gewährleistung				**Note 1**: Die Anforderungen komplett akzeptiert **Note 2:** Die Anforderungen werden mit wenigen leichte bzw. wenigen unwesentlichen Abweichungen akzeptiert **Note 3:** Die Anforderungen werden mit mehreren leichten Abweichungen akzeptiert **Note 4:** Die Anforderungen werden mit vielen leichten oder wenigen kritischen Abweichungen akzeptiert **Note 5:** Die Anforderungen werden mit vielen kritischen Abweichungen akzeptiert **Note 6:** Die Anforderungen werden nicht akzeptiert		5%			0,00			0,00
		Sonstige Leistungen						5%			0,00			0,00
		Vertragsdauer, Kündigung						10%			0,00			0,00
		Vergütung Projektteil (Preis, Einhaltung der Preisstruktur, Klarheit möglicher Preisentwicklungen bei Veränderten Rahmenbedingungen)						30%			0,00			0,00

		Vergütung operativer Teil (Preis, Einhaltung der Preisstruktur, Klarheit möglicher Preisentwicklungen bei Veränderten Rahmenbedingungen, finanzielle Auswirkungen auf Anpassungen an Konzernveränderungen)						50%			0,00			0,00
2	Betriebs-vertrag	***Vertrag (Absicherung der Vertragsrisiken, z.B. Haftung, Insolvenzklausel, Schadensersatzklausel, Pönaleregelung)***				Note 1 - Note 6		10%	Angebots-Bewertung	Schul-note		Angebots-Bewertung	Schul-note	
								100%		**0,00**			**0,00**	
		Leistungsgegenstand/Vertragsgestaltung - Werkvertragscharakter hinsichtlich Konfiguration bleibt erhalten, insbesondere die Abnahme. - Es werden keine Anbieter AGB zum Gegenstand des Vertrages gemacht.				**Note 1:** Die Anforderungen komplett akzeptiert **Note 2:** Die Anforderungen werden mit wenigen leichte bzw. wenigen unwesentlichen Abweichungen akzeptiert **Note 3**: Die Anforderungen werden mit mehreren leichten Abweichungen akzeptiert **Note 4:** Die Anforderungen werden mit vielen leichten oder wenigen kritischen Abweichungen akzeptiert **Note 5:** Die Anforderungen werden mit vielen kritischen Abweichungen akzeptiert **Note 6:** Die Anforderungen werden nicht akzeptiert		30%			0,00			0,00

		Nutzungsrechte - Applikationsplattform (plus Zugriffssoftware falls einschlägig)- Datenbanken und Datenbankenwerke - Dokumentation - Schulungsunterlagen - Arbeitsergebnisse - Neue Programmversionen					20%			0,00			0,00
		Subunternehmer, Geheimhaltung und Informationspflichten - Einsatz von Subunternehmern - Geheimhaltung und Vertraulichkeit					20%			0,00			0,00
		Vertragliche Sekundäransprüche - Vertragliche Sekundäransprüche (inkl. Vertragsstrafen) - Schutzrechte Dritter					15%			0,00			0,00
		Sonstiges **-** Schlussbestimmungen - Änderungen des Leistungsumfangs - Mitwirkungs- und Beistellungspflichten					15%			0,00			0,00
		Datenschutz					5%	Angebots-Bewertung	Schul-note		Angebots-Bewertung	Schul-note	
							100%		**0,00**			**0,00**	

		TOMs des Suppliers entsprechen den EBS Anforderungen				**Note 1:** Die Anforderungen komplett akzeptiert**Note 2:** Die Anforderungen werden mit wenigen leichte bzw. wenigen unwesentlichen Abweichungen akzeptiert**Note 3**: Die Anforderungen werden mit mehreren leichten Abweichungen akzeptiert**Note 4:** Die Anforderungen werden mit vielen leichten oder wenigen kritischen Abweichungen akzeptiert**Note 5:** Die Anforderungen werden mit vielen kritischen Abweichungen akzeptiert**Note 6:** Die Anforderungen werden nicht akzeptiert		25%			0,00			0,00
		Haftung Datenschutzverstöße (Unbegrenzte Haftung für Datenschutzverstöße vollständig akzeptiert)						25%			0,00			0,00
		Vertragsstrafe Datenschutz (geforderte Vertragsstrafe wird in voller Höhe akzeptiert)						25%			0,00			0,00
		Auditrechte (Unsere Anforderungen akzeptiert)						25%			0,00			0,00
3		***SRM Risk Ranking***						0%						

				Eine Bewertung der für die Ausschreibung ausgewählten Anbieter ist bereits im Vorfeld erfolgt. Daher ist eine Berwertung innerhalb dieser Matrix nicht notwendig.										
II) IT-Bewertung / Summary aus Vertragsunterlagen						(Note 1)Indikator	(Note 6)Indikator	Gewichtung						
lfd. Nr.		Kategorie	Unterkategorie/Kriterium	Kriterium	Quelle				Angebots-Bewertung	Schul-note		Angebots-Bewertung	Schul-note	
4		***fachliche Bewertung***						30%						
								100%		**2,84**			**2,10**	
			Inhaltliche Erfüllung / Abdeckung der Anforderungen											

4_1		*Funktionale Anforderungen*		Das Angebot wird den Anforderungen des Prozesses Incident Management gerecht.		**Note 1:** Es wurden mehr 94,9 % der Requirements erfüllt **Note 2:** Es wurden zwischen 90,0% und 94,9% der Requirements erfüllt **Note 3**: Es wurden zwischen 80,0% und 89,9% der Requirements erfüllt **Note 4:** Es wurden zwischen 70,0% und 79,9% der Requirements erfüllt **Note 5:** Es wurden zwischen 50,0% und 69,9% der Requirements erfüllt **Note 6:** Es wurden weniger als 50,0% der Requirements erfüllt		4,0%		**1**	0,04		**3**	0,12
4_2		*Funktionale Anforderungen*		Das Angebot wird den Anforderungen des Prozesses Problem Management gerecht.		**Note 1:** Es wurden mehr 94,9 % der Requirements erfüllt **Note 2:** Es wurden zwischen 90,0% und 94,9% der Requirements erfüllt **Note 3**: Es wurden zwischen 80,0% und 89,9% der Requirements erfüllt **Note 4:** Es wurden zwischen 70,0% und 79,9% der Requirements erfüllt **Note 5:** Es wurden zwischen 50,0% und 69,9% der Requirements erfüllt **Note 6:** Es wurden weniger als 50,0% der Requirements erfüllt		4,0%		**1**	0,04		**3**	0,12
4_3		*Funktionale Anforderungen*		Das Angebot wird den Anforderungen des Prozesses Change Management gerecht.		**Note 1:** Es wurden mehr 94,9 % der Requirements erfüllt **Note 2:** Es wurden zwischen 90,0% und 94,9% der Requirements erfüllt **Note 3**: Es wurden zwischen 80,0% und 89,9% der Requirements erfüllt **Note 4:** Es wurden zwischen 70,0% und 79,9% der Requirements erfüllt **Note 5:** Es wurden zwischen 50,0% und 69,9% der Requirements erfüllt **Note 6:** Es wurden weniger als 50,0% der Requirements erfüllt		4,0%		**1**	0,04		**3**	0,12

4_4		*Funktionale Anforderungen*		Das Angebot wird den Anforderungen des Prozesses Configuration Management gerecht.		**Note 1:** Es wurden mehr 94,9 % der Requirements erfüllt**Note 2:** Es wurden zwischen 90,0% und 94,9% der Requirements erfüllt**Note 3**: Es wurden zwischen 80,0% und 89,9% der Requirements erfüllt**Note 4:** Es wurden zwischen 70,0% und 79,9% der Requirements erfüllt**Note 5:** Es wurden zwischen 50,0% und 69,9% der Requirements erfüllt**Note 6:** Es wurden weniger als 50,0% der Requirements erfüllt		4,0%		**1**	0,04		**3**	0,12
4_5		*Funktionale Anforderungen*		Das Angebot wird den Anforderungen des Prozesses Service Level Management gerecht.		**Note 1:** Es wurden mehr 94,9 % der Requirements erfüllt**Note 2:** Es wurden zwischen 90,0% und 94,9% der Requirements erfüllt**Note 3**: Es wurden zwischen 80,0% und 89,9% der Requirements erfüllt**Note 4:** Es wurden zwischen 70,0% und 79,9% der Requirements erfüllt**Note 5:** Es wurden zwischen 50,0% und 69,9% der Requirements erfüllt**Note 6:** Es wurden weniger als 50,0% der Requirements erfüllt		4,0%		**2**	0,08		**3**	0,12

4_6		*Funktionale Anforderungen*		Das Angebot wird den Anforderungen in Bezug auf ITSM (IT Service Management) und non-ITSM gerecht.		**Note 1:** Es wurden mehr 94,9 % der Requirements erfüllt **Note 2:** Es wurden zwischen 90,0% und 94,9% der Requirements erfüllt **Note 3**: Es wurden zwischen 80,0% und 89,9% der Requirements erfüllt **Note 4:** Es wurden zwischen 70,0% und 79,9% der Requirements erfüllt **Note 5:** Es wurden zwischen 50,0% und 69,9% der Requirements erfüllt **Note 6:** Es wurden weniger als 50,0% der Requirements erfüllt		20,0%		**3**	0,60		**3**	0,60
4_8		*Funktionale Anforderungen*	Optionale Module (End User Portal, Request Fulfilment, Governance Risk Compliance, Availability, Capacity, Knowledge, Cloud Lifecycle, Service Catalogue und Project Portfolio Management)	Das Angebot erfüllt die Anforderungen der optionalen Module hauptsächlich 'Out of the box' und es benötigt kaum Anpassungsaufwand	EBS ITSM Requirements Catalogue Avlb_01 - DocM_16	**Note 1:** Es wurden mehr 94,9 % der Requirements erfüllt**Note 2:** Es wurden zwischen 90,0% und 94,9% der Requirements erfüllt**Note 3**: Es wurden zwischen 80,0% und 89,9% der Requirements erfüllt**Note 4:** Es wurden zwischen 70,0% und 79,9% der Requirements erfüllt**Note 5:** Es wurden zwischen 50,0% und 69,9% der Requirements erfüllt**Note 6:** Es wurden weniger als 50,0% der Requirements erfüllt		10,0%		**4**	0,40		**2**	0,20

4_9		*Nicht-Funktionale Anforderungen*	Projektvorgehensweise inkl. Vorlaufzeit	Das Angebot wird den Anforderungen der Projektvorgehensweise (bzgl. Interface Requirements, Project Requirements und Data Migration Requirements) gerecht; nachvollziehbarer projektplan, Projektstart kurz nach Vertragsabschluss möglich	EBS ITSM Requirements Catalogue Inte_01-Inte_18 + Pror_01+ DatM01 & Operating and Use Agreement	**Note 1:** Es wurden mehr 94,9 % der Requirements erfüllt **Note 2:** Es wurden zwischen 90,0% und 94,9% der Requirements erfüllt **Note 3**: Es wurden zwischen 80,0% und 89,9% der Requirements erfüllt **Note 4:** Es wurden zwischen 70,0% und 79,9% der Requirements erfüllt **Note 5:** Es wurden zwischen 50,0% und 69,9% der Requirements erfüllt **Note 6:** Es wurden weniger als 50,0% der Requirements erfüllt		10,0%		**4**	0,40		**1**	0,10
4_10		*Nicht-Funktionale Anforderungen*	User Interface	Das Angebot wird den Anforderungen des Bereichs User Interface Requirements gerecht		**Note 1:** Es wurden mehr 94,9 % der Requirements erfüllt**Note 2:** Es wurden zwischen 90,0% und 94,9% der Requirements erfüllt**Note 3**: Es wurden zwischen 80,0% und 89,9% der Requirements erfüllt**Note 4:** Es wurden zwischen 70,0% und 79,9% der Requirements erfüllt**Note 5:** Es wurden zwischen 50,0% und 69,9% der Requirements erfüllt**Note 6:** Es wurden weniger als 50,0% der Requirements erfüllt		10,0%		**3**	0,30		**2**	0,20

4_11		*Nicht-Funktionale Anforderungen*	Betrieb (Operations + Security + Availailability + Downtimes)	Das Angebot wird den Anforderungen des Bereichs Betrieb (bzgl. Operational Requirements und User Volume and Scalability Requirements) gerecht		**Note 1:** Die Anforderungen komplett akzeptiert **Note 2:** Die Anforderungen werden mit wenigen leichte bzw. wenigen unwesentlichen Abweichungen akzeptiert **Note 3**: Die Anforderungen werden mit mehreren leichten Abweichungen akzeptiert **Note 4:** Die Anforderungen werden mit vielen leichten oder wenigen kritischen Abweichungen akzeptiert **Note 5:** Die Anforderungen werden mit vielen kritischen Abweichungen akzeptiert **Note 6:** Die Anforderungen werden nicht akzeptiert		20,0%		**3**	0,60		**1**	0,20
4_12		*Nicht-Funktionale Anforderungen*	Upgradefähigkeit	Das Angebot erfüllt die Anforderung der unkomplizierten Upgradefähigkeit (d.h. Upgrades haben eine vertretbare Auswirkung auf vorhandene Customisations, Maßnahmen für Tests und Fixing verhalten sich in einem		**Note 1:** Die Anforderungen komplett akzeptiert **Note 2:** Die Anforderungen werden mit wenigen leichte bzw. wenigen unwesentlichen Abweichungen akzeptiert **Note 3**: Die Anforderungen werden mit mehreren leichten Abweichungen akzeptiert **Note 4:** Die Anforderungen werden mit vielen leichten oder wenigen kritischen Abweichungen akzeptiert **Note 5:** Die Anforderungen werden mit vielen kritischen Abweichungen akzeptiert **Note 6:** Die Anforderungen werden nicht akzeptiert		10,0%		**3**	0,30		**2**	0,20

				vernünftigen Rahmen)										