

GUIDELINE: INNOVATIVE PRODUCT DEVELOPMENT

Abstract

This guideline and its corresponding checklist tools [Product development – customer checklist](#), [Product development – cooperation checklist](#), [Product development – marketing strategy checklist](#), and [Product development – product checklist](#) support internal processes within utilities when developing well-aligned smart energy product and service innovations. This guideline will focus more on the process and what steps to take, while the information and questions within the checklists will help you to set up a process for information and support gathering within several departments of your utility.

What is it?

Changing energy markets put new demands on utilities. The development process of energy products and services will change, and the previous technical focus will be replaced with organizational collaboration across departments. Traditional energy product¹ development and the development of smart energy products and services are different from many aspects (more detailed information can be found in the [“before you start”](#)-section); for instance what triggers the development of products, how the actual development is conducted, sales, marketing and aftersales. To support utilities in this novel situation, this guideline offers advice on the different aspects of smart product and service development, specifically focusing on the steps leading up to the launch of the new products.

Different departments in utilities have a different understanding of what is meant by the term product development. While traditional retail product developers see their task in the annual re-pricing processes of tariffs, the newer innovation or product design requirements are more differentiated. Responsible parties have to consider completely new energy services, cooperation with other stakeholders and companies to find synergies, cross- or up-selling options etc. This is a stark contrast to previous focus topics in product development centring mostly around technical feasibility. In particular, the departments of product development and innovation, marketing and sales, after sales and customer care are usually involved in the development of new smart energy products and services.

To succeed in the development of new energy services, the different departments within a utility should have a common understanding and agreed upon process for product innovation, and the interlinkages between the involved departments have to be established. Whether you work in a team or by yourself to develop new services

¹ The most basic one being purchasing of energy quantities.

and products, this guideline will help you to structure the exchange between yourself and your colleagues. Together with the tools [Product development – customer checklist](#), [Product development – cooperation checklist](#), [Product development – marketing strategy checklist](#), and [Product development – product checklist](#) you can apply the information and guidance offered to set up a comprehensive and well-structured process including all the necessary players while anticipating possible bottlenecks, competency issues and delays.

The guideline and the corresponding checklists are not geared towards an analytic process within a research project to define or innovate the development and launch process as such. They rather represent current internal practicalities that utilities are faced with, and provide support in dealing with them.

The information and questions within the checklists will help you to set up a process for information and support gathering within several departments of your utility. This process can be designed in numerous ways (for two suggestions, see What do you need to do? section). The checklists will help you to gather necessary information from different departments and/or external experts that you will need to elaborate your innovative product or service idea. The checklists furthermore contain fruitful tips on how departments can work together and identify topics which so far have not played an important role for product development and product launches.

A “before you start”-section in the guideline points to the major differences between traditional energy product development and the development of smart energy products and services within utilities to sensitize you for the obstacles and challenges you might come across while developing and promoting an innovative product within your utility.

When to use?

This guideline can be implemented by product developers that are faced with the challenge of developing a smart energy service or product. The guidance and checklists can be utilised to establish the idea of a new product or service within your company by structuring a workshop (series) for stakeholders from different departments. They can also be implemented as support for bilateral product innovation and launch processes. Detailed ideas on these implementations can be found in the What do you need to do? section. However, it's important to remember that in the end, the way you organise your development is completely up to you.

As soon as you have developed your first innovative product idea, the advice within the guideline and practical guidance of the corresponding tools can be implemented. You should, however, not start before you have outlined at least a rough idea of what your product or service is supposed to look like. Practical, less abstract information

of what you are striving for will help colleagues in other departments help understand their input and contribution to your process. The checklists will shed light on potential questions that will develop your rough idea into a full product ready for launch. They represent discrete steps in product development, e.g. how the customer is affected by a new product, which (potentially new) cooperations have to be taken into account to make the product a success and how this affects marketing strategies.

S3C's active partner ABGnova, an innovation spin-off of the German utility mainova, has found the guidance offered by the structured checklists helpful

- in reducing the complexities of their work,
- in deducing and anticipating open questions for collaboration and further development,
- because of its flexibility (the checklists can be applied by one or many persons, the time horizon for their application is not restricted),
- because the checklists are organised close to actual utility processes, making them easy to understand and implement for practitioners.

What do you need to do?

In principle, you have to two general options for implementing the advice in this guideline and the tools that go along with it.

- **Option A: Collaborative series of at least two workshops to create sensitivity for smart product development (more abstract):** This approach is particularly relevant to sensitize your colleagues in different departments for the new challenges arising over the development and implementation of new products.
- **Option B: Guideline and checklists are used to structure the work flow when developing a new product (more concrete):** The checklists and guideline are used by an individual or a team to structure the bilateral exchanges with different departments and potential partners associated with the development of a new, smart energy product or service.

You can of course also combine the two approaches starting off with a workshop that is to sensitize all stakeholders in the utility in the first place and to introduce the new product idea and then carrying out the actual work in bilateral talks shaped by the structure as presented in the checklists to make the project more concrete.

If you want to follow Option A:

1) Develop your first smart product idea

The first step of this process takes place before the first workshop, and includes writing an initial elaboration of the business case. This should be started well ahead of the time you have planned for the market entrance of

your product, as many development processes of smart energy products and services require the approval of CTOs, CEOs etc.

2) Read the “before you start section in this guideline

The difference between traditional and innovative, smart energy products has a strong impact on the processes and stakeholders in utilities. Before starting off with analysing and answering the checklists, you should get a sense of the difficulties and challenges you might face in process of further product development and product launches. The [section](#) offers an overview of the most important challenges and stumbling stones.

3) Prepare for the first workshop

Make sure to go through the guideline and the checklists thoroughly. Reflect on your company’s culture and code of conduct to decide whether certain questions should be left out or restructured/rephrased. Personalise the questions for your product idea. Can you already individualise some if the abstract question for your concrete product idea? The more precise questions, the more precise answers you’ll receive in the workshops. Form your own opinion on critical points to be able to make suggestions – in case discussions get stuck. Based on the content of the questions, identify all relevant stakeholders within your company and find a suitable date for the first workshop.

Reflect on the size of your company and its different departments. In small utilities, there might be a retail department and some product developers, but you might have to ask for advice on market research or go-to cooperation partners. If you work in a large utility, the competencies and contact persons might be scattered over all sorts of different departments and sub-groups. Read the guideline and the checklists thoroughly! Form your own opinion on critical points to be able to make suggestions – in case discussions get stuck.

4) Reflect on your company’s culture and code of conduct to decide whether certain questions should be left out or restructured/rephrased.

Personalise the questions for your product idea, if you can already make some if the abstract question ? The more precise your questions are, the more precise the answers you’ll receive will be. See also do’s and don’ts

5) Reflect on the size of your company and its different departments

If you work in a small utility, you might a retail department and some product developers, but you might have to ask for advice on market research or go-to cooperation partners. See which contact points for the different questions to be answered you have In reverse: If you work in a large utility, the

competencies and contact persons you might need for answering one set of questions might be scattered over all sorts of different departments and sub-groups. If you are unsure, who should be invited, don't hesitate to get in touch with colleagues or call other departments to those stakeholders pointed out that are the most relevant for your product idea. The extra work in preparing the workshop will pay off.

Invite the identified persons and send them the checklist questions that you want them to answer before the workshop, if possible, so they can prepare optimally! Think about in which order you are going to go through the checklists. You should start off with the [Product development – customer checklist](#). Depending on the type of product you are developing, the order of the following checklist can vary. Checklist Tools are available for customer-related questions, product-oriented-questions, marketing strategies and cooperation.

6) Conduct the first workshop - Create a good working atmosphere for your workshop

Instead of starting out with checking every guideline question bit by bit, give your colleagues some interesting insights, facts and figures on the background of your product idea to raise interest and increase acceptance for the approach. It is important for them to understand that they are not just present for some abstract reasons, but for the concrete purpose of further developing the product idea and getting it closer to the product launch. Furthermore, try to anticipate some of the conflict lines you might come across.

While you and the workshop participants are going through the checklists for the first time, be flexible and leave room for discussion. The questions you are going to be asking will refer to knowledge of different departments and stakeholders: This can create discussion and tension, but it is important to create room and time for these issues. Don't be afraid of not finding a solution for every conflict of interest during this first workshop. Deeper discussions can be postponed until after the first workshop has concluded by the relevant parties and a common approach can be found in a second workshop. The first workshop is there to create sensitivity for these interdependencies, open questions and missing knowledge and procedures in the first place.

Keep track of answers, open questions that could not be answered right away, interdependencies between different stakeholders, critical processes pointed out by the others, misunderstandings etc. throughout the workshop. Don't be afraid to give your colleagues, especially those highly engaged in the

discussions on competencies or those that could not answer the question relevant for you, with homework. Everything that cannot be answered in the first workshop should be taken offline by your participants, so that you can find or develop answers in the second workshop.

In addition, make sure to critically assess the checklists together with the participants. Are there any obsolete questions? Do some questions or topics have to be added?

7) Agree on a date for the second workshop

Depending on how many open questions, interdependencies to be dealt with etc. you detected, a second workshop should rather be arranged sooner than later to leave people sufficient time to prepare.

8) Repeat the routine

The same structure should be implemented for the second workshop as for the first one. This time, focus on the open questions and the answers gathered by your participants. In the end, you should have answered your questions and established a firm idea in your colleagues what you will be up to in the next weeks or months and who can expect a further visit or phone call from you. Maybe you can even persuade some of your colleagues from other departments to (ir)regularly support you.

If you are not able to answer the questions and agree on a follow up process, set the date for another workshop. You should be aware of the fact that the necessity for further clarification can be renewed during the second workshop. In fact, planning with much leeway and add some extra time to cover eventualities in the overall process is crucial.

9) Substantiate and communicate

Start filling out the checklists and develop a clearer picture of what your innovation product (bundle) looks like. Give the colleagues that supported you throughout the workshop updates on your progress and let them know when milestones are achieved, so they remain “on board” and potential allies to support your product.

If you want to follow Option B:

If one person or team drives the process, filling out the checklists will lead to a constant bilateral exchange with many other responsible parties within and outside of the utility. The product and launch team will constantly search for statements and facts to strengthen and flesh out their product idea. If you are striving to organise such a process, the following steps can serve as orientation.

1) Plan your product development process

Set yourself milestones that refer to gaining knowledge about certain aspects. E.g. when will you/do you have to deliver a first sketch of your product to the executive level? When is the time for market launch? When do you want to have the different checklist filled out? Make sure your own time schedule does not suffer too much from dependencies on details. If so – make suggestions on how to cope with uncertainty.

2) Make use of the checklists

Develop the product idea further on your own by using the questions in the checklists. Again, start off with the customer checklist. Don't proceed until you have developed a firm idea of what you are striving for that you can explain and "sell" to your colleagues. Structure the aspects you are not able to answer by the likely information owner in your company. In the end, you can e.g. come up with your own customised version of the checklists that clearly indicate who will be asked about which issues. Depending on the size of your company, it is possible that the information owners work within different departments and have rarely been in contact before.

3) Get in contact with co-workers

Depending on your company's culture, get in contact with those information owners – preferably one at a time. Explain to them about your product idea and why their input is necessary. Gather information from all relevant co-workers through discussions. Make sure to first distribute the relevant part of the checklists and give the information owners, i.e. the potential supporters of your product idea, time to prepare for discussing these aspects with you. Make sure that all discussions on relevant questions for the new product are covered to achieve a high reliability for the working process.

4) Substantiate and communicate

Once you have gathered all information you need and fleshed out your idea and the most important eventualities, you should consider writing a short report on your findings to your information owners to make sure that you understood everything correctly and the stakeholders within the utility are on the same page. If no further discussion points emerge, you can proceed to take your product or service to the executive level to achieve a decision about its launch.

ABGnova and Mainova utility, Frankfurt, Germany

Together with our active partner ABGnova, the S3C consortium supported a product development cycle based on this guideline and its corresponding checklists. The innovation agency ABGnova which belongs to Frankfurt am Main's utility mainova and the mainova sales department gathered for a workshop, in which an innovative product idea of was evaluated against the checklists. Based on the product idea that had already been developed, the participants of the workshop worked through the checklist to identify gaps, challenges and to do's for the further implementation of the product idea. After the workshop, the checklists helped the innovation manager in charge to keep track of the developments initiated with the workshop. He finalized the business case and gave it to the management for decision. It included recommendations for actions - their origins were developed in the workshop. By continuously working through the checklist, the interdependencies between different processes and department activities became obvious and delays and bottlenecks could be identified and mitigated. Furthermore, the checklists helped to explain the product idea clearly to third parties and to render a structures impression of which next steps would have to be taken.

Do's and don'ts

The checklist tools contain specific advice and hints on what to do and how to do it. However, a few dos and don'ts relate to the entire process of developing a new product and will be elaborated in the following. These aspects are mainly related to expectation management. The main message is that this guideline and the checklist tools can help you, but the development and introduction of smart energy products remains a challenge – especially when traditional structures and behaviors remain unnoticed.

- **Consider different structured workshop- and moderation concepts (relevant to option A).** It is important to add a moderation concept to the structure already provided by the checklists. This concept should encourage discussions and open exchange, but also keep a firm grip on the direction of the overall process. We do not suggest a specific moderation style or method as successful moderation strongly depends on the personal preferences of the moderators. In fact, rely on methods you know well and feel comfortable with.
- **Plan for opposition.** In order to avoid conflict in your institution, you should not carry out the advice from the checklist without prior reflection on your own business culture. Adapt the checklists to your particular context. Are there any specifics in your organisation that are not anticipated by the guideline? Do you think that some wordings might be difficult to understand for your colleagues?
- **Don't expect the process to be running smoothly all of the time.** This guideline will help you to run a more structured process and remind you of the open ends that still have to be tied up. However, other prerequisites that you cannot influence have to be fulfilled in order to introduce your product. A successful collaboration within in the utility is one decisive precursor to a

successful product launch, but other factors such as regulation and overall economic development are crucial as well.

- **Don't expect that all your checklist questions can be answered right away.** Even those questions that might seem trivial to you might not have been answered previously. The systems your colleagues use to store their relevant information and knowledge might not deliver information in exactly the way you need it. Thus, make sure to provide clear descriptions of what information you need and give your colleagues time to look for well researched and thorough answers. Don't expect them to know right away.
- **Don't expect that a retail success is guaranteed by following the advice of this guideline.** This guideline can help you to accomplish a successful process within the utility. Whether the product is going to have a successful market entrance or not is dependent on a variety of external factors.

Before you start

This section will render a short overview of the differences between traditional and innovative, smart energy services. If a utility company wants to develop new products, who will be put in charge? There may be initial outside support by consulting firms or responsible parties will decide to purchase certain competences or market research results - but internal departments of a utility will be involved early on in the process - at latest when accounting processes for the new products have to be clarified or communication processes with the utility's own customers start. . These traditional departments carry out their work for energy suppliers while being subjected to different requirements and other priorities. Thus, they often have a completely different perspective on the innovation process than external consultants or market researchers. It is one of the main challenges to help these two types of actors to collaborate constructively to arrive at a sound result. The first step ahead is to develop an understanding for the different perspectives. This guideline section will help you to understand the different takes on the development process.

To ensure a better understanding of the current requirements for the process taking place between product development and product launch, the process was divided into several sequences. Depending on the company, processes may run in parallel or may be bundled in the same department. To understand the requirements and the process, it is important that the task at hand and applied approaches are clear.

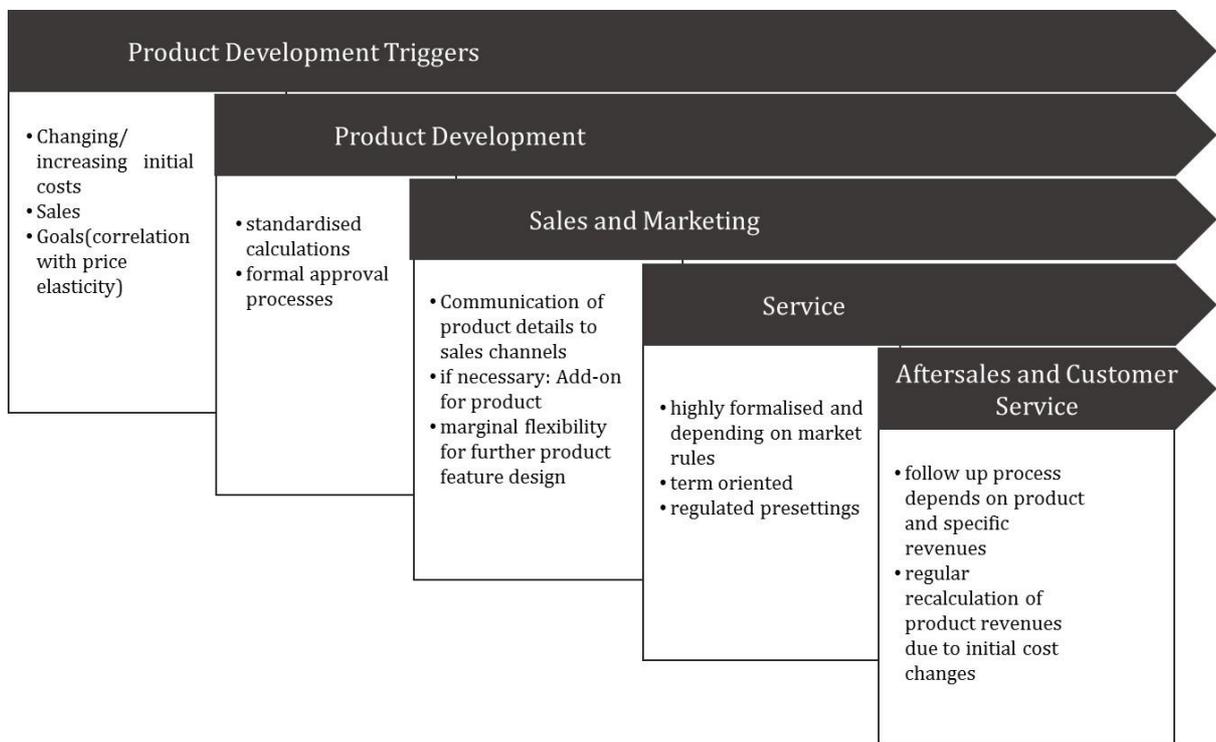


Figure 1 the traditional energy delivery product and service development process in sequences
 Source: the S3C consortium

For traditional energy delivery products and services, in most cases, product development is triggered by a change in the initial costs. These changes can be attributed to increasing procurement costs on the stock exchange or to changed taxes or government levies. Special sales requirements can trigger thoughts about new products as well. These thoughts could develop into innovative ideas on e.g. starting sales processes in a new area or trying to sell a product via new channels which require special pricings or services.

Product Development Triggers

In essence, the company and its employees will follow a highly structured and predetermined process to develop their idea or initial product sketch into a product ready to launch. They will consider the number of customers who might switch to another product or which can be reached with a new product. It will create forecasts, what happens when they do not make product development or product customization.

Product development

A responsible party in the company will (has to) decide at a certain point in time, under which conditions the product is offered. This development process does not

fundamentally question the existence of alternative ways of product delivery, communications, accounting or another possible change. Each potential customer needs energy which is grid-bound and displays no difference in quality based on different tariff types or products chosen. For the customer, the price has been the decisive factor for a product decision and the internal costs have been the decisive factor for a successful market entrance.

Sales and marketing

When analysing aspects and processes underlying sales and marketing, one will see that they do not offer a great degree of freedom for creative experimentation. Depending on the regulatory framework, there is a lesser or greater variety of customer contact points and communication channels, but when it comes to the signing of a contract utilities must adhere to many formal contract law.

Product development focuses on ensuring transparent pricing for customers and confirms the area- and time-specific procurement and variable cost calculations. Potential partners like online tariff comparison platforms or retail partners have to receive their commissions, customer data must be handled carefully and the contract has to be designed in a legally reliable way.

Service and after sales/customer service

These sale requirements for energy products continue in the future customer communication. In a call to a customer after the contract has been signed, the service department will at all times ensure that the customer is specifically advised for the product and it is billed accurately. Of course, complex IT systems are in use now and facilitate this part. However, it can still be challenge to identify which customer is billed according to which tariff exactly, as the number of tariffs offered by one and the same supplier often enter the three digit-mark.

To sum it up, the current process of product development is hedged by high demands on pricing and mastering the complexity that is reflected in the formal requirements for the communication with the customer in the complete customer lifecycle. Consideration of whether the customer actually needs the product or what he might be interested in in general often fall short. All components of a product bundle, such as additional services or completion bonuses are valued from a cost perspective, not from their value proposition to the consumer.

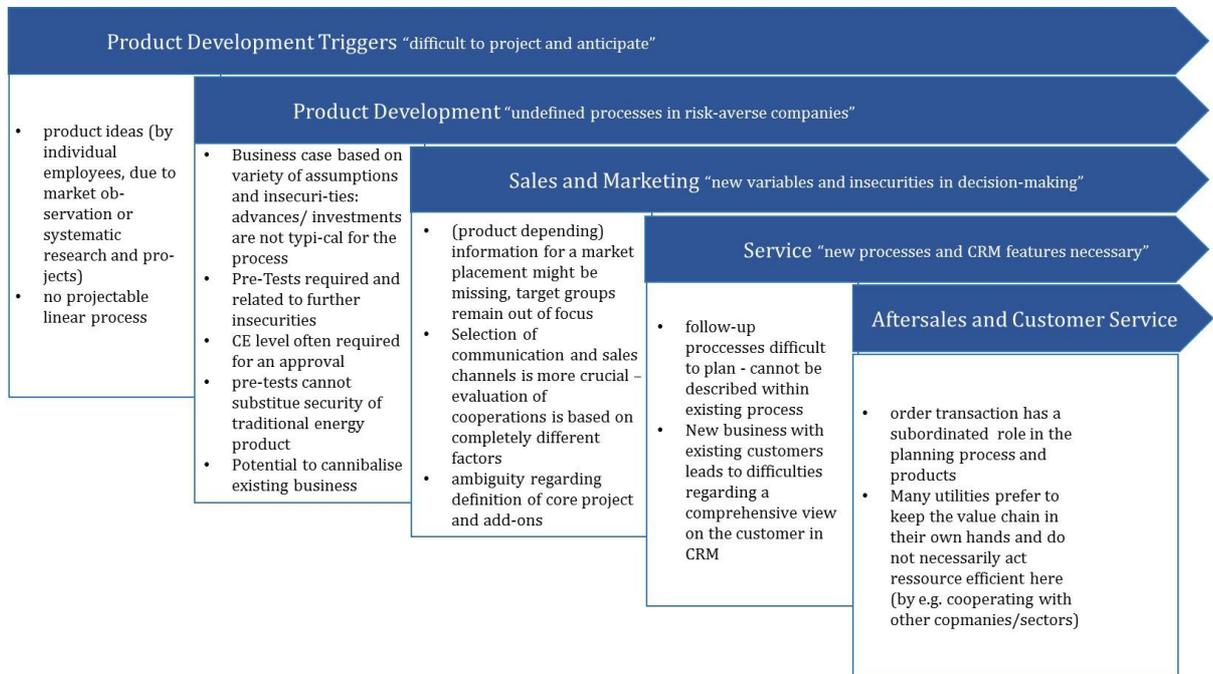


Figure 2 the innovative energy delivery product and service development process in sequences
 Source: the S3C consortium

In comparison, for the development of innovative smart energy service products and especially in the development of products that are technology dependent, the phases of product development differentiate strongly. Sometimes they deviate strongly from the phases in the development of more 'traditional' products (compare figure 1 and 2).

Product development triggers

The differences in the development and launch process of smart energy service products compared to traditional products already start at the 'trigger' for developing a new product. The triggers for developing a new smart energy service product vary greatly and can be connected to very different time-scales for entering the market. In most cases market development is in a very early stage and the pressure to perform is not as urgent as in the mature market. Examples for such a trigger are e.g. that the results of a project have to be transferred to "real" situations or that market observation or changes reveal a demand for imitation products ("me-too products"). Accordingly, the development trigger for new smart energy products are often changes that are not cost-based. Cost-based changes, e.g. to initial costs, need to be taken into account for all existing as well as new products, but can be temporarily decoupled from the process in the development of a new smart energy service product.

Product development

The product development for innovative products and services draws from greater freedom – going hand-in-hand with greater risks and insecurities – already starts before the precise development and launch process in your utility. The initial phase – creating the first rough draft of the product or service – is characterized by the feasibility analysis of the new product, including the technical feasibility, as well as developing a business case for it. Furthermore, an often rewarding option is to already think about involving the customer in this early phase of the product development process. For more information on how to involve customers in the decision-making process, please refer to the S3C guideline [Co-creation – collaborating to develop smart energy solutions](#).

One pitfall of the product development phase can be attributed to setting wrong or unclear deadlines for the completion and launch of the new product which can hinder the development process. Deadlines tend to be assigned strictly from a competitive point of view. However, deadlines solely focused on the goal “launching the new product as soon as possible” can have a negative impact on the product quality and time management in the departments involved in the development process. *This guideline and corresponding checklists facilitate and structure the cross-departmental development process by double-checking the needs and responsibilities of the different parties from an early-on stage in the product development.*

An additional pitfall becomes evident when existing schemes are used to calculate the price. In the development of new smart energy service products, an exact identification and calculation of each factor influencing the price are seldom possible. Due to the prevalent uncertainty about the costs as well as the potential share of other stakeholders, it is necessary to implement new calculation models that integrate existing approval processes as well as new variables. At the same time, the mentioned uncertainty calls for a close attention by the management on the overall development process, i.e. work level product developers will likely be in contact with the executive level throughout the development process and defer decisions to upper levels.

Lastly, certain aspects of corporate culture can have a strong and sometimes negative impact on the development progress, e.g. a too strong focus on security can be an impediment in the development of smart energy service products. The strong involvement of the executive level and lengthy processes aiming to calculate all unknown factors can drag the development to a point at which market entrance is not possible anymore or comes too late. *This guideline and its corresponding checklists can uncover uncertainties in the development process and facilitate the decision-making process for the management.*

Marketing and sales

In the marketing and sales of new smart energy service products, there is one key new aspect that is often underestimated. In order to sell traditional energy supply products, there is no need to explain to the customers why to buy energy or how to use it.

Answering these questions for the customer creates completely new challenges for the marketing and sales department reaching from identifying the right target group for the new product to adapting the product and its marketing campaign according to the customers' needs. For additional advice on the marketing and sales of smart energy service products relating to the product development, please refer to the S3C guidelines [Learning about target groups](#), [How to make energy visible through feedback](#), [Introducing smart appliances](#), and [Choosing and combining monetary and non-monetary incentives](#).

Additionally, utilities need to differentiate further in their choice of communication and sales channels. When choosing the communication and sales channels, utilities need to differentiate further by soft criteria, such as existing competence for the product. Many new products require the involvement of technicians (e.g. IT installers for Smart Meters) or other specialists (e.g. to communicate the advantages of a new product to customers). Classic media coverage can serve to advertise and explain complex product and build a contact point for communication with customers. However, media coverage requires second level services and further qualified specialists from the field. *This guideline and its corresponding checklists for the areas of sales and marketing as well as market research can reveal new aspects in the field of marketing and sales and facilitate a consistent market cultivation strategy.*

Service and aftersales/ customer support

In the field of services, some tight regulatory requirement, e.g. the components that each bill has to contain in a certain predetermined way, might be reduced for innovative smart products – others like product liability may appear. However, there is an overall tendency to underestimate the additional requirements regarding logistics and technical services for smart energy product services. Questions to ask in this phase of the product development would, for example, be: Who is responsible for technical malfunctions or poor instructions?

It is of particular importance to come up with a follow up process in aftersales that is not the usual standardised one, but build along the specifics of the innovative product and anticipates some of the difficulties the new customers might have. Within the utility, another follow-up process for the product has to be designed to follow the revenue brought in by the new product.

This internal process can help to shed light on the previously (during the development phase) unknown variables and can serve to adapt the product to the ever changing initial costs. Thus, the innovative, risky product becomes controllable.

This guideline was developed in the S3C project, and is freely available from www.smartgrid-engagement-toolkit.eu.

S3C paves the way for successful long-term end user engagement, by acknowledging that the "one" smart consumer does not exist and uniform solutions are not applicable when human nature is involved. Beyond acting as a passive consumer of energy, end users can take on different positions with respective responsibilities and opportunities. In order to promote cooperation between end users and the energy utility of the future, S3C addresses the end user on three roles. The *smart consumer* is mostly interested in lowering his/her energy bill, having stable or predictable energy bills over time and keeping comfort levels of energy services on an equal level. The *smart customer* takes up a more active role in future smart grid functioning, e.g. by becoming a producer of energy or a provider of energy services. The *smart citizen* values the development of smart grids as an opportunity to realise "we-centred" needs or motivations, e.g. affiliation, self-acceptance or community.

S3C (2012-2015) performed an extensive literature review and in-depth case study research on end user engagement in smart grids, resulting in the identification of best practices, success factors and pitfalls. The analysis of collected data and experiences led to the development of a new, optimised set of tools and guidelines to be used for the successful engagement of either Smart Consumers, Smart Customers or Smart Citizens. The S3C guidelines and tools aim to provide support to utilities in the design of an engagement strategy for both household consumers and SMEs. The collection of guidelines and tools describe the various aspects that should be taken into account when engaging with consumers, customers and citizens. More information about S3C, as well as all project deliverables, can be found at www.s3c-project.eu.